

Company: Noble Energy Inc.

Well: Shadow A26-656

Field: Wattenberg

County: Weld State: Colorado

UltraSonic Summary Print

|  |                        |
|--|------------------------|
| County:                                    | Weld                   |
| Field:                                     | Wattenberg             |
| Location:                                  | SWNE Sec 30 T6N R63W   |
| Well:                                      | Shadow A26-656         |
| Company:                                   | Noble Energy Inc.      |
| Location:                                  |                        |
| SWNE Sec 30 T6N R63W                       | Elev.: K.B. 4680.00 ft |
| SHL: 2298 FNL 2335 FEL                     | G.L. 4650.00 ft        |
| Latitude: 40.458450 Longitude: -104.478610 | D.F.                   |
| Permanent Datum:                           | Ground Level           |
| Log Measured From:                         | Kelly Bushing          |
| Drilling Measured From:                    | Kelly Bushing          |
| API Serial No.                             | Section: 30            |
| 05-123-42881                               | Township: 6N           |
|  | Range: 63W             |

|                           |                             |
|---------------------------|-----------------------------|
| Logging Date              | 29-Jun-2016                 |
| Run Number                | One                         |
| Depth Driller             | 17347.00 ft                 |
| Schlumberger Depth        | 17347.00 ft                 |
| Bottom Log Interval       | 6650.00 ft                  |
| Top Log Interval          | 0.00 ft                     |
| Casing Fluid Type         | Brine                       |
| Salinity                  |                             |
| Density                   | 8.4 lbm/gal                 |
| Fluid Level               | 8.00 ft                     |
| BIT/CASING/TUBING STRING  |                             |
| Bit Size                  | 8.50 in                     |
| From                      | 1903.00 ft                  |
| To                        | 17347.00 ft                 |
| Casing/Tubing Size        | 5.5 in                      |
| Weight                    | 20 lbm/ft                   |
| Grade                     | P110                        |
| From                      | 30.00 ft                    |
| To                        | 17326.70 ft                 |
| Max Recorded Temperatures | 211 degF                    |
| Logger on Bottom          | 29-Jun-2016 11:00:00        |
| Unit Number               | 2161                        |
| Recorded By               | Avery Becker / Stephen Tang |
| Witnessed By              |                             |

Disclaimer

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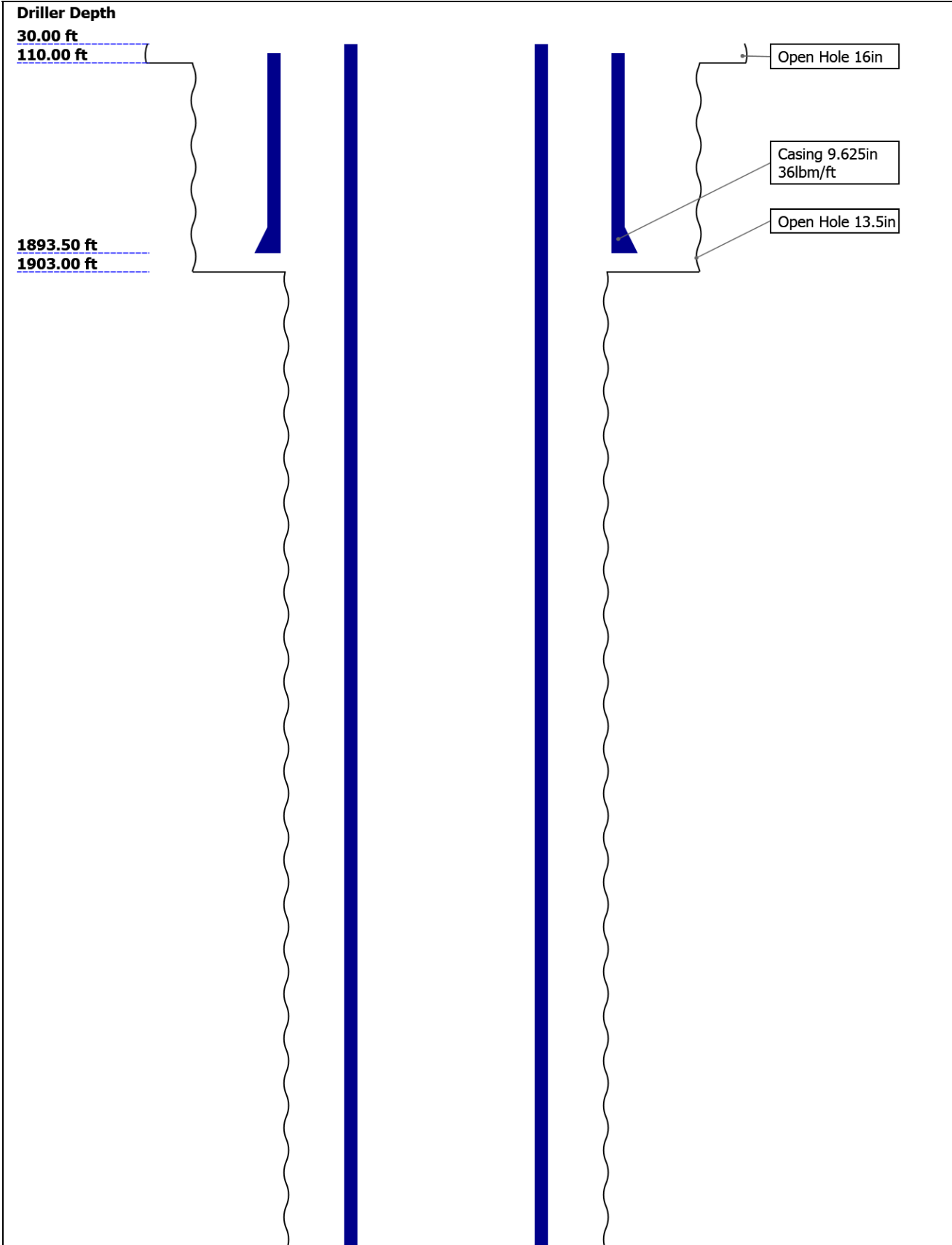
Contents

- Header
- Disclaimer
- Contents
- Well Sketch
- Borehole Size/Casing/Tubing Record
- Remarks and Equipment Summary
- Depth Summary
- USI Fluid Properties Measurement\_1
- One 2500 PSI Main Pass
  - Integration Summary
  - Software Version
  - Composite Summary
  - Log ( DJ Basin Ultrasonic Cement Summary Report )
  - Parameter Listing
- One 0 PSI Repeat Pass
  - Integration Summary

- in )
- Tail

- 10.2 Software Version
- 10.3 Composite Summary
- 10.4 Log ( DJ Basin Ultrasonic Cement Summary Report )
- 10.5 Parameter Listing
- 11. XYZ ( USI Fluid Acoustic Slowness vs Depth 3.0 in )
- 12. XYZ ( USI Acoustic Impedance of Mud vs Depth 3.0

Well Sketch



17326.70 ft

17347.00 ft


Casing 5.5in  
20lbm/ft

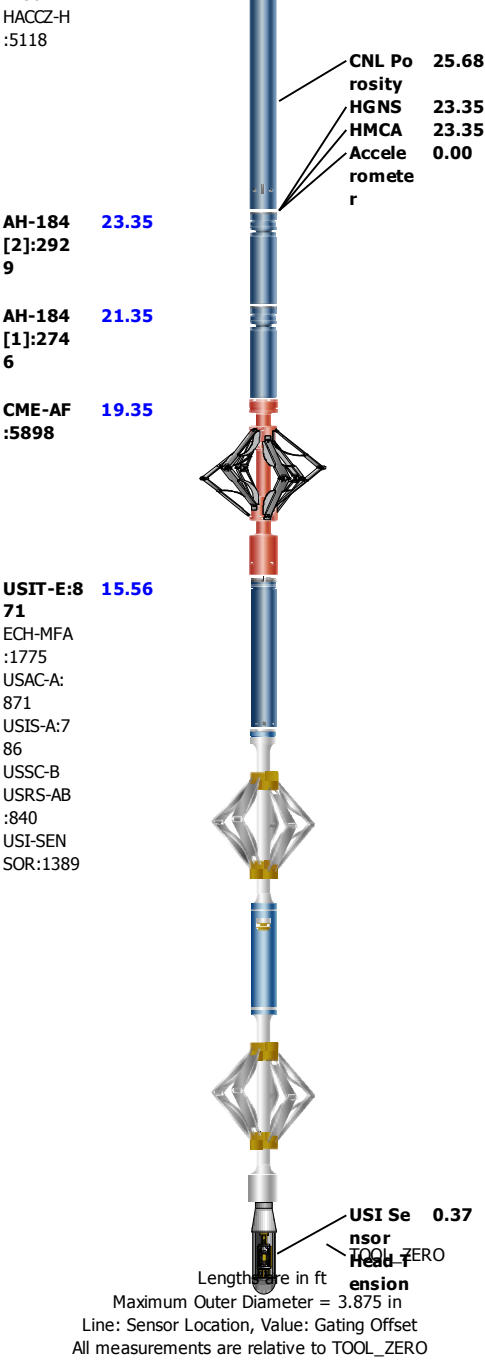
Open Hole 8.5in

Borehole Size/Casing/Tubing Record

|                       |        |         |       |  |  |  |
|-----------------------|--------|---------|-------|--|--|--|
| Bit                   |        |         |       |  |  |  |
| Bit Size ( in )       | 16     | 13.5    | 8.5   |  |  |  |
| Top Driller ( ft )    | 30     | 110     | 1903  |  |  |  |
| Top Logger ( ft )     | 30     | 110     | 1903  |  |  |  |
| Bottom Driller ( ft ) | 110    | 1903    | 17347 |  |  |  |
| Bottom Logger ( ft )  | 110    | 1903    | 17347 |  |  |  |
| Casing                |        |         |       |  |  |  |
| Size ( in )           | 9.625  | 5.5     |       |  |  |  |
| Weight ( lbm/ft )     | 36     | 20      |       |  |  |  |
| Inner Diameter ( in ) | 8.921  | 4.778   |       |  |  |  |
| Grade                 | N/A    | P110    |       |  |  |  |
| Top Driller ( ft )    | 30.1   | 30      |       |  |  |  |
| Top Logger ( ft )     | 30.1   | 30      |       |  |  |  |
| Bottom Driller ( ft ) | 1893.5 | 17326.7 |       |  |  |  |
| Bottom Logger ( ft )  | 1893.5 | 17326.7 |       |  |  |  |

Remarks and Equipment Summary

| One: Toolstring  |   |  | One: Remarks |  |  |
|--|---|--|--------------|--|--|
| <div><div><div>Equip nameLength</div><div>LEH-QT43.53</div><div>LEH-QT</div></div><div><div>SAH-F40.61</div></div><div><div>DTC-H:835.76</div><div>803</div><div>ECH-KC:10354</div><div>DTC-H:8803</div><div>HGNS-H:4736</div><div>HGNH:2987</div><div>NPV-N</div><div>NSR-F:5069</div><div>HMCA-H</div><div>HGNS-H:4736</div></div></div> <div></div> <div><div>MP nameOffset</div><div>1817</div></div> | First run in well depth control procedures followed           |  |              |  |  |
|  | Toolstring run as per tool sketch                             |  |              |  |  |
|  | CSG: 5.5 in, 20 lb/ft   |  |              |  |  |
|  | Main pass recorded at 2500 psi, repeat pass recorded at 0 psi |  |              |  |  |
|  | Log recorded at 10 deg, 6 in resolution                       |  |              |  |  |
|  |   |  |              |  |  |



| Depth Summary            |             |     |  |
|--------------------------|-------------|-----|--|
|                          |             | One |  |
| Depth Measuring Device   |             |     |  |
| Type                     | IDW-JA      |     |  |
| Serial Number            | 5896        |     |  |
| Calibration Date         |             |     |  |
| Calibrator Serial Number | 16          |     |  |
| Calibration Cable Type   | 7-46 PLX    |     |  |
| Wheel Correction 1       | -1          |     |  |
| Wheel Correction 2       | -3          |     |  |
| Tension Device           |             |     |  |
| Type                     | CMTD-B/A    |     |  |
| Serial Number            | 1109        |     |  |
| Calibration Date         | 13-Apr-2016 |     |  |
| Calibrator Serial Number | 441435A     |     |  |

|                                    |    |  |  |
|------------------------------------|----|--|--|
| Number of Calibration Points       | 10 |  |  |
| Calibration Root Mean Square Error | 10 |  |  |
| Calibration Peak Error             | 17 |  |  |

|                 |             |  |  |
|-----------------|-------------|--|--|
| Logging Cable   |             |  |  |
| Type            | 7-39P-LXS   |  |  |
| Serial Number   |             |  |  |
| Length          | 15000.00 ft |  |  |
| Conveyance Type | Wireline    |  |  |
| Rig Type        |             |  |  |

|                              |                       |                       |  |
|------------------------------|-----------------------|-----------------------|--|
| One:Depth Control Parameters |                       | Depth Control Remarks |  |
| Log Sequence                 | First Log In the Well |                       |  |
| Rig Up Length At Surface     |                       |                       |  |
| Rig Up Length At Bottom      |                       |                       |  |
| Rig Up Length Correction     |                       |                       |  |
| Stretch Correction           |                       |                       |  |
| Tool Zero Check At Surface   |                       |                       |  |

USIT - Fluid Properties Measurement

| Run Name | Pass Name | Start Depth(ft) | Stop Depth(ft) |
|----------|-----------|-----------------|----------------|
| Run 1    | Log[2]:Up | 6656.42         | 69.49          |

| Fluid Velocity = "Automatic".<br>CFVL equals DFSL channel |                |                    |                  |
|---|----------------|--------------------|------------------|
| Start Depth(ft)   | Stop Depth(ft) | Start Value(us/ft) | End Value(us/ft) |

| Mud Impedance = "FreePipe Norm."<br>Free Pipe normalization zone is : 202.63m(664.81ft) to 210.57m(690.85ft)<br>MUD_N_FRP = 1.17<br>DFD = 1.01g/cm3(8.40lbm/gal)<br>CZMD median computed in free pipe normalization interval = 1.76 MRayl |                |                    |                  |
|---|----------------|--------------------|------------------|
| Start Depth(ft)   | Stop Depth(ft) | Start Value(Mrayl) | End Value(Mrayl) |

|                    |  |  |  |
|--------------------|--|--|--|
| One                |  |  |  |
| 2500 PSI Main Pass |  |  |  |

| Software Version   |  |                |
|--------------------|--|----------------|
| Acquisition System |  | Version        |
| Maxwell 2016 SP2   |  | 6.2.64464.3100 |

| Pass Summary |                |           |          |            |                         |                         |          |             |                       |
|--------------|----------------|-----------|----------|------------|-------------------------|-------------------------|----------|-------------|-----------------------|
| Run Name     | Pass Objective | Direction | Top      | Bottom     | Start                   | Stop                    | DSC Mode | Depth Shift | Include Parallel Data |
| One          | Log[2]:Up      | Up        | 69.49 ft | 6656.42 ft | 29-Jun-2016 11:48:01 AM | 29-Jun-2016 12:25:35 PM | ON       | 4.43 ft     | No                    |

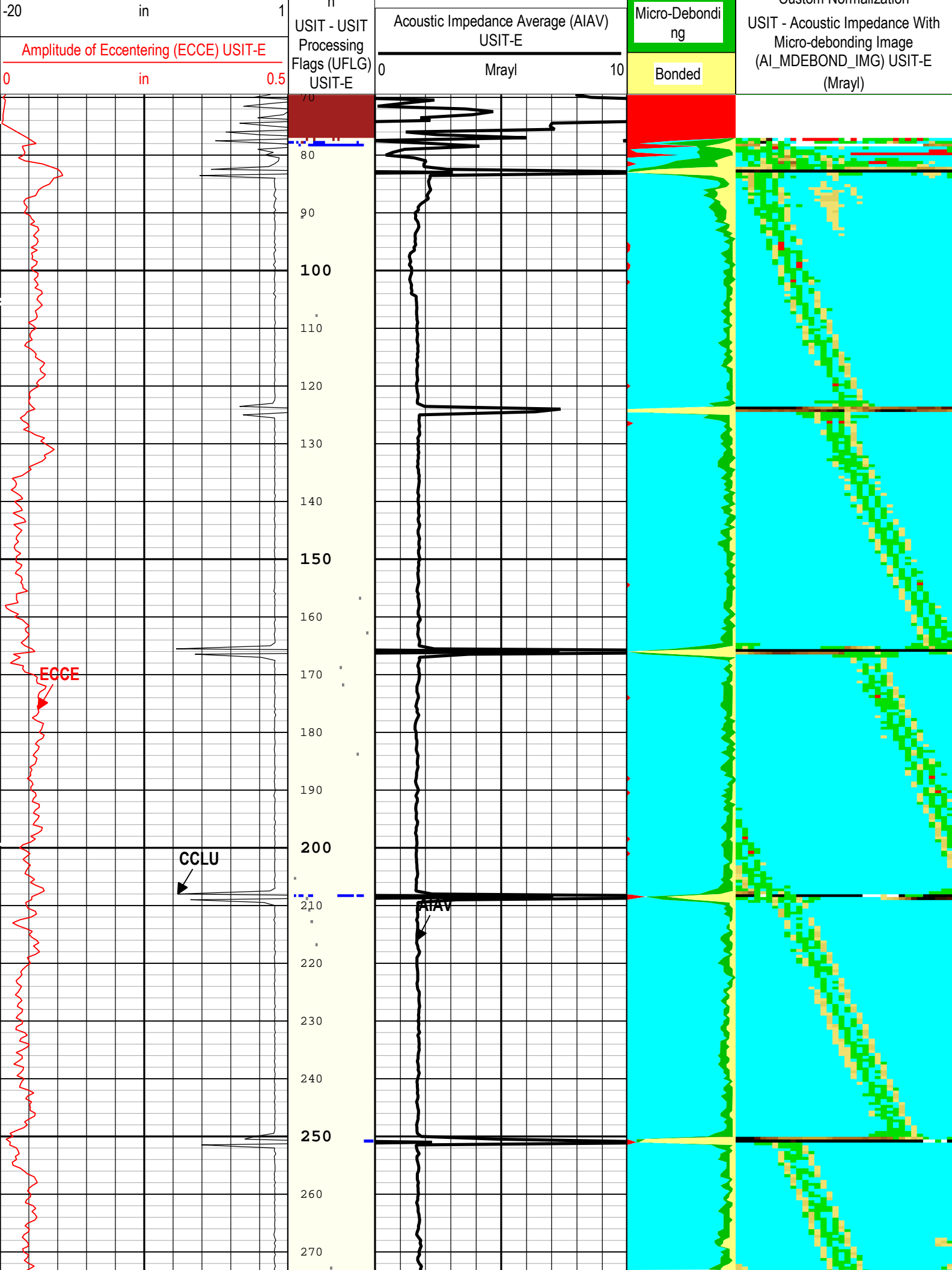
All depths are referenced to toolstring zero

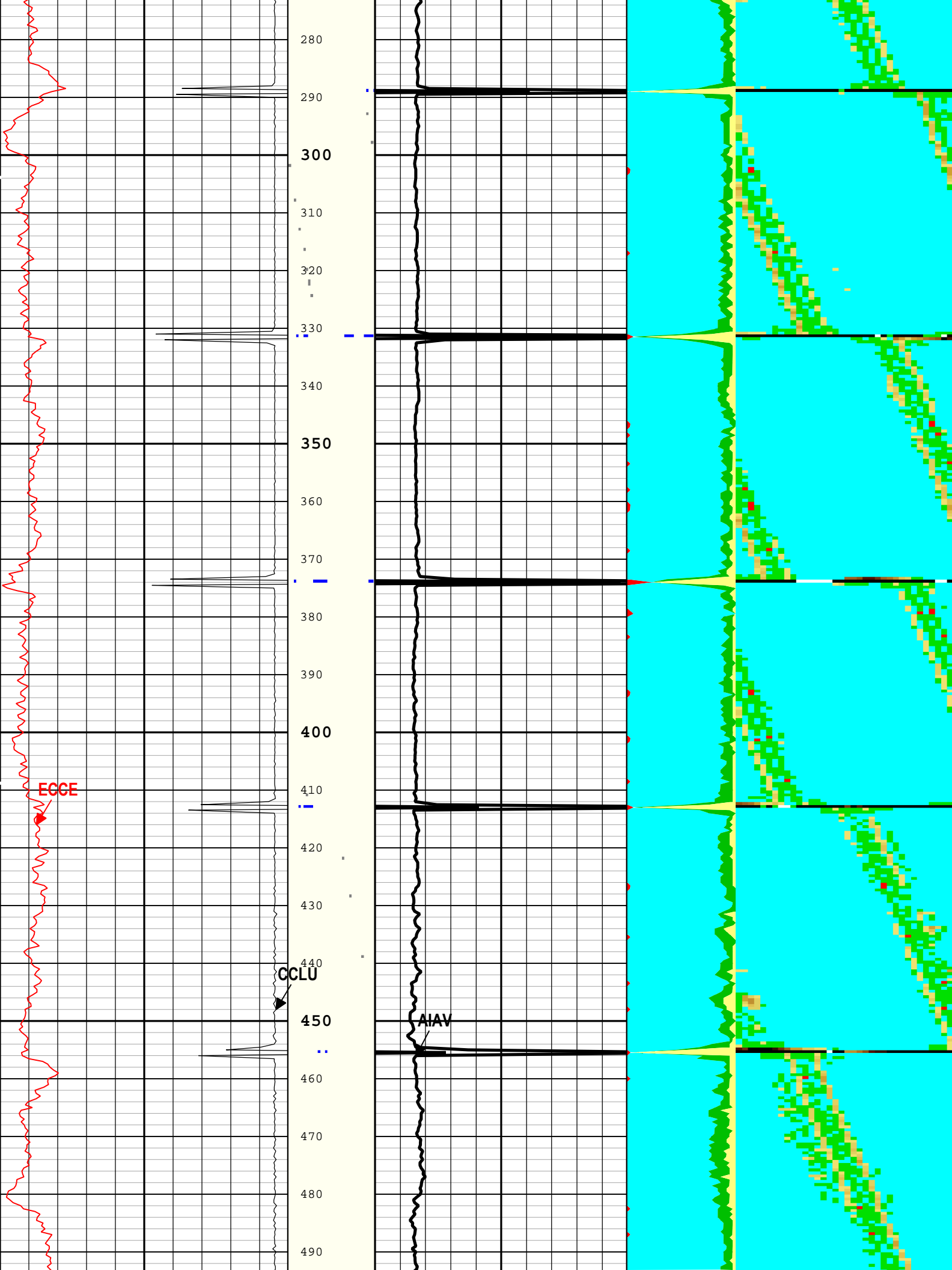
|     |                           |                     |
|-----|---------------------------|---------------------|
| Log | Company:Noble Energy Inc. | Well:Shadow A26-656 |
|     |                           | One: Log[2]:Up:S005 |

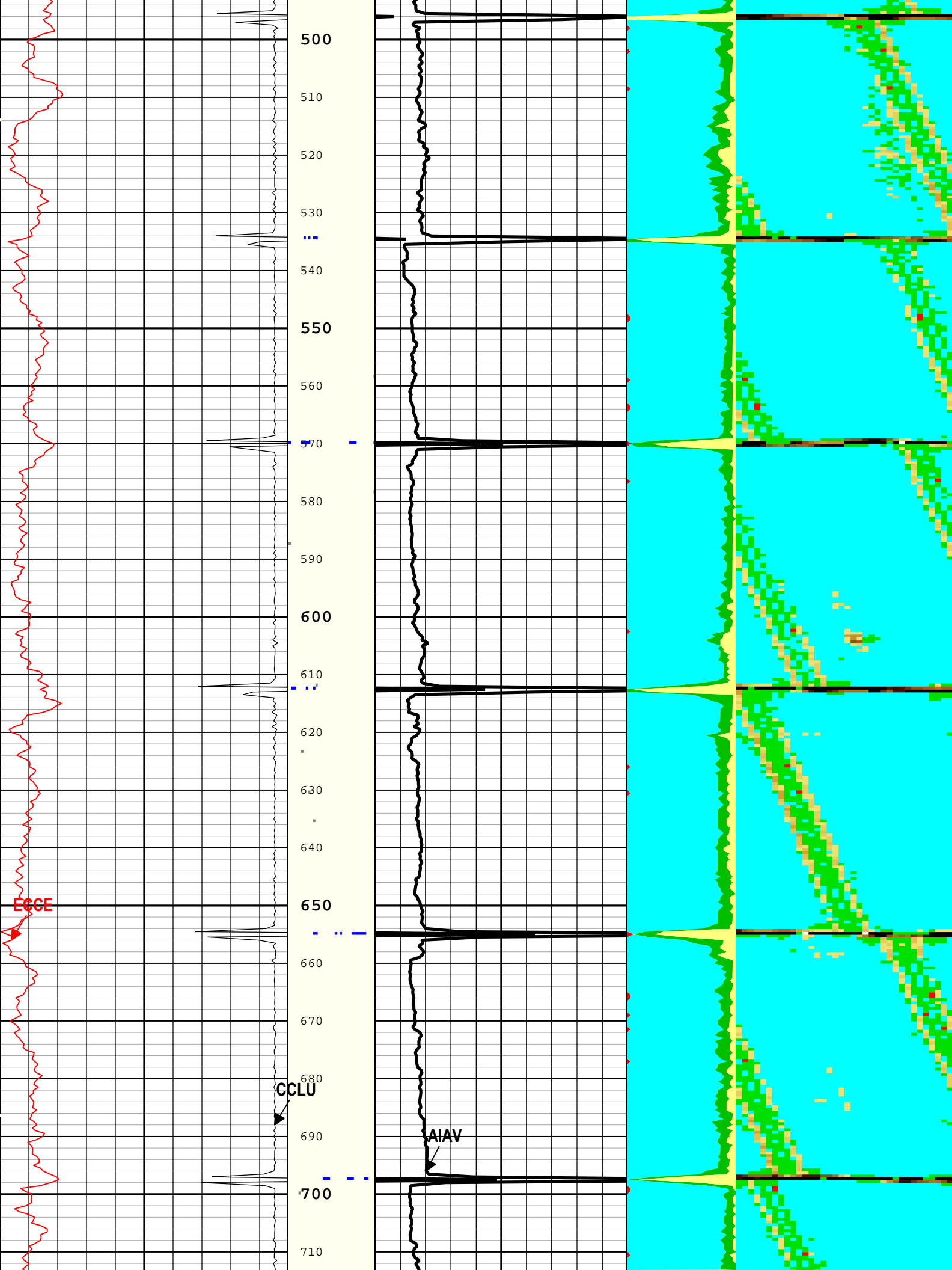
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Creation Date: 29-Jun-2016 12:44:43

TIME\_1900 - Time Marked every 60.00 (s)

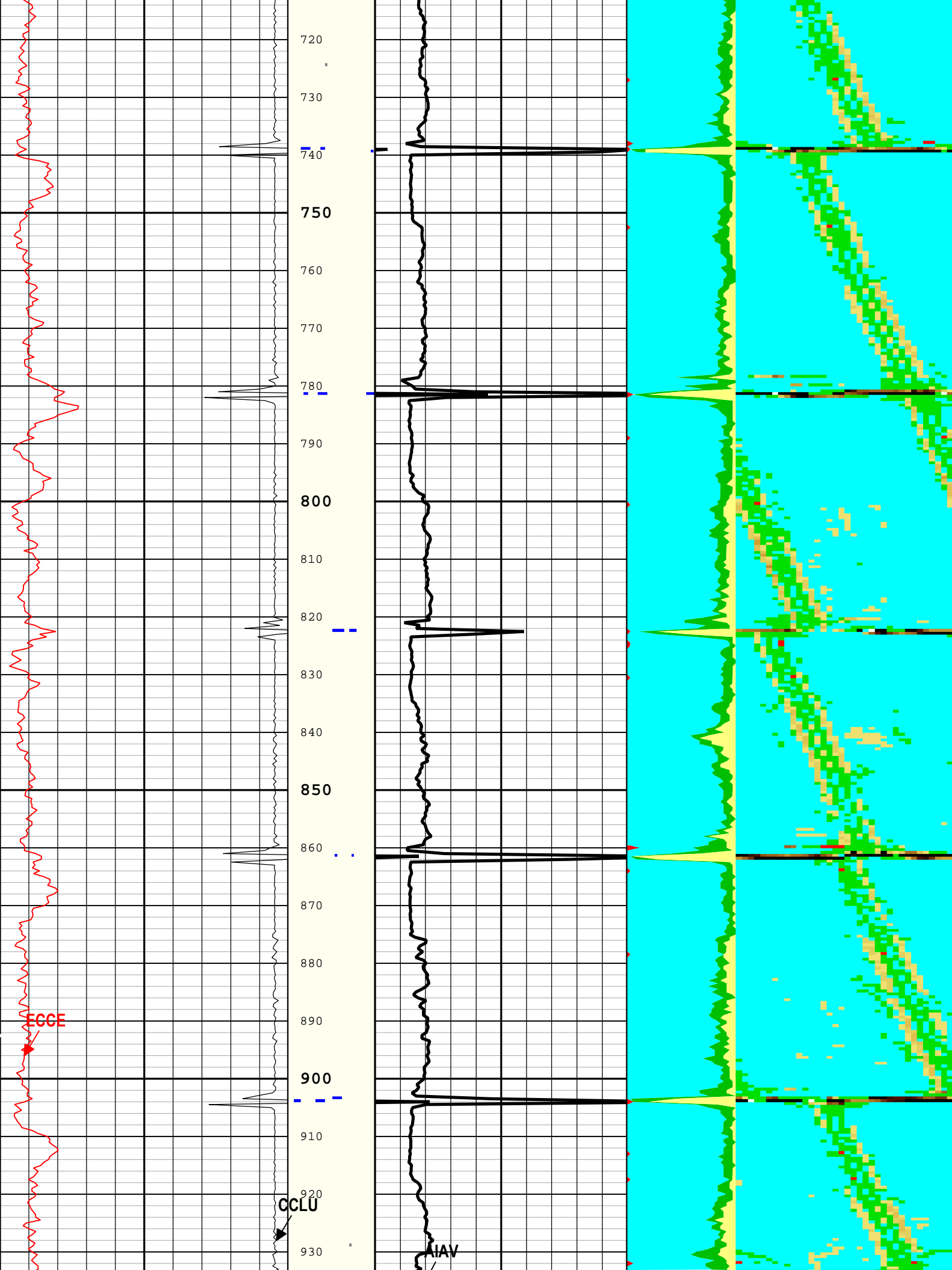


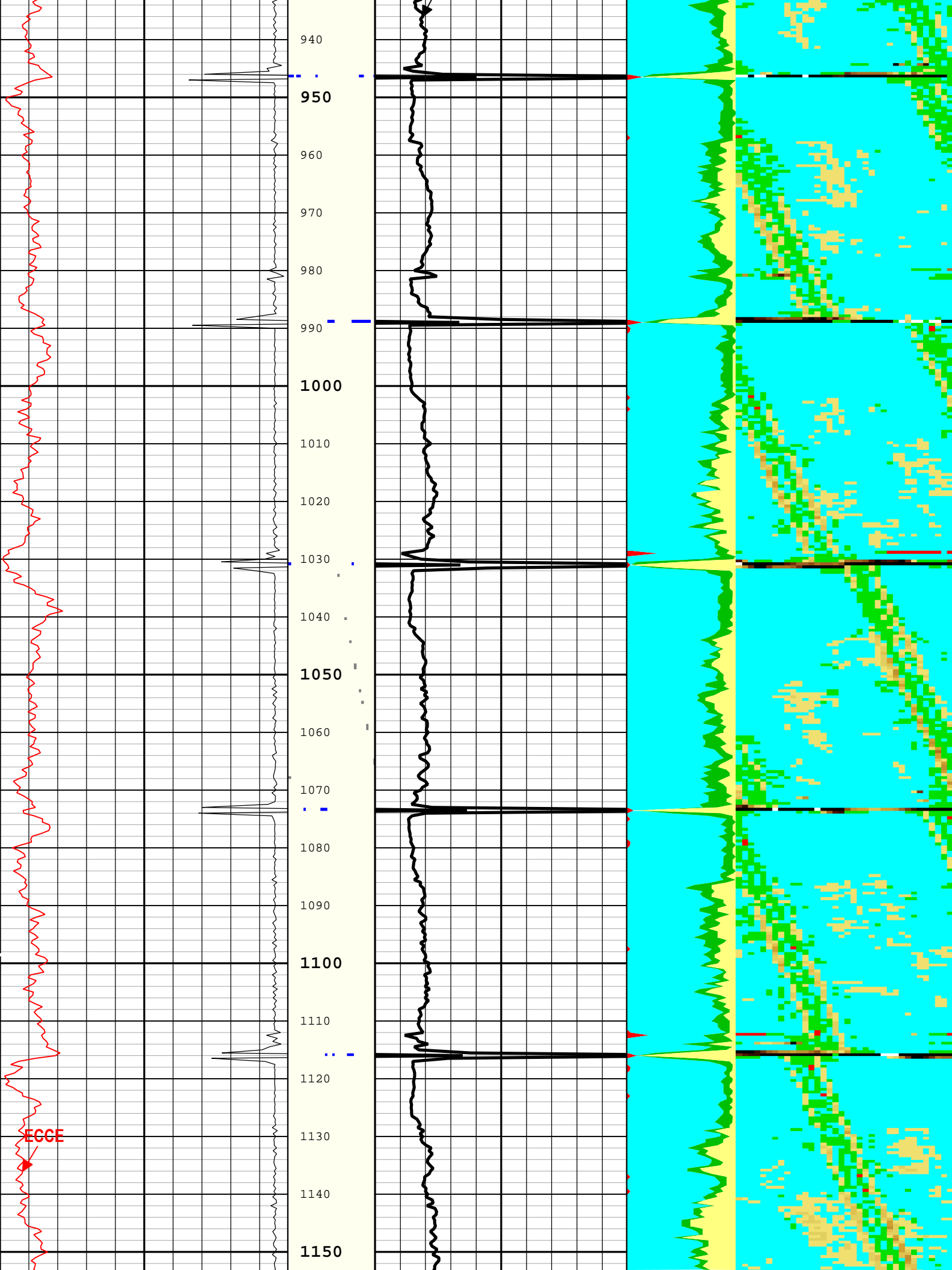


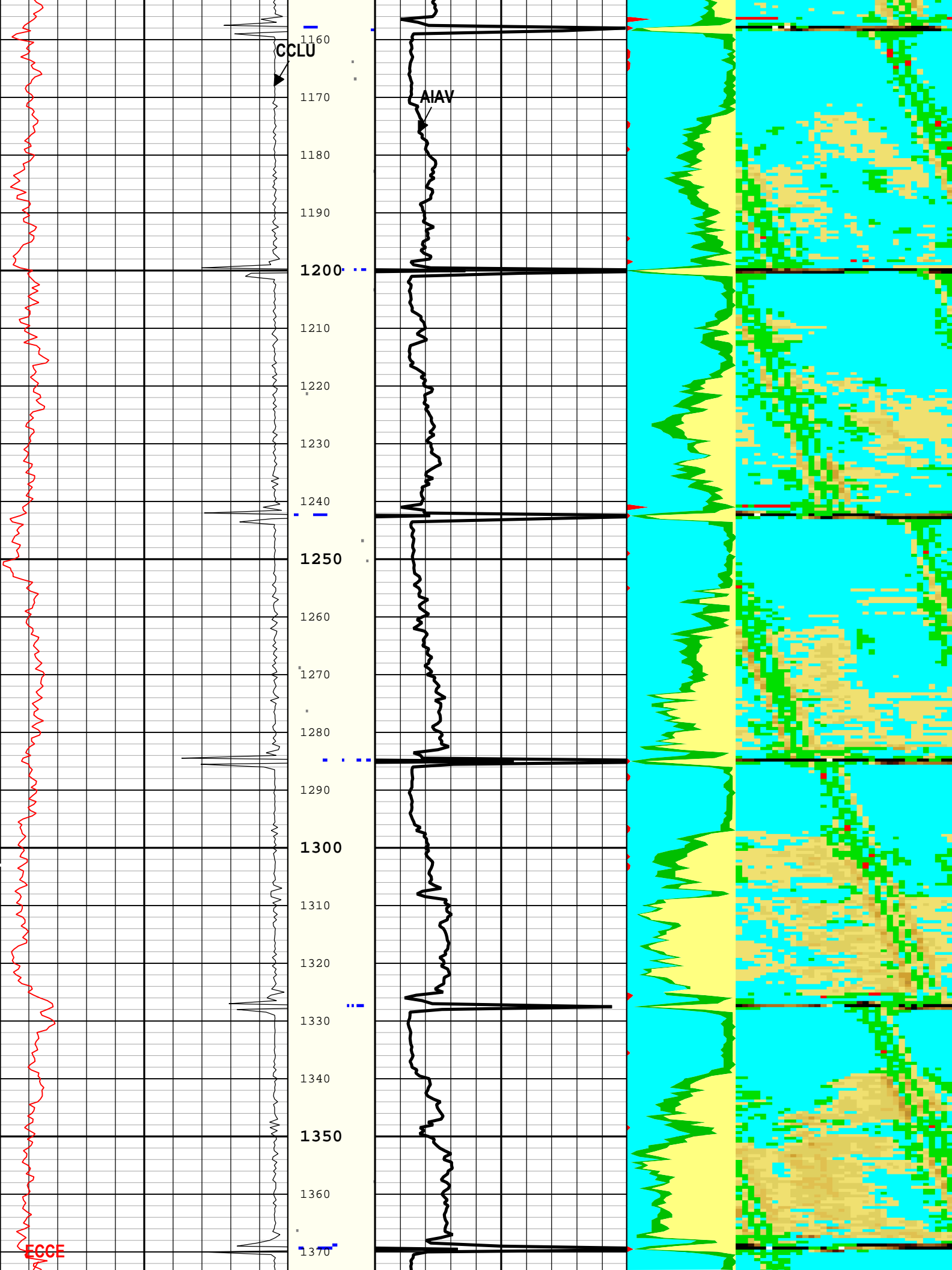


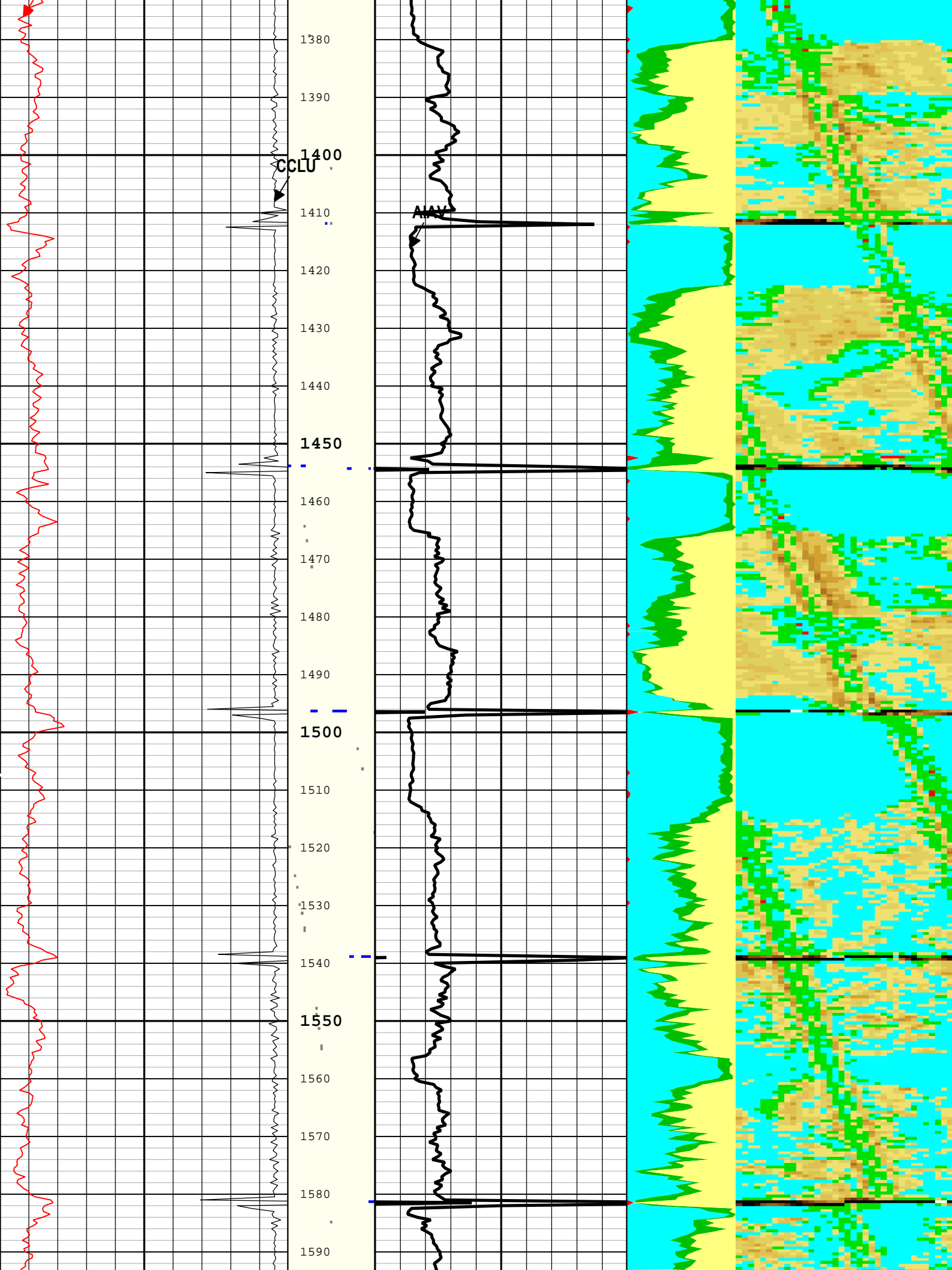


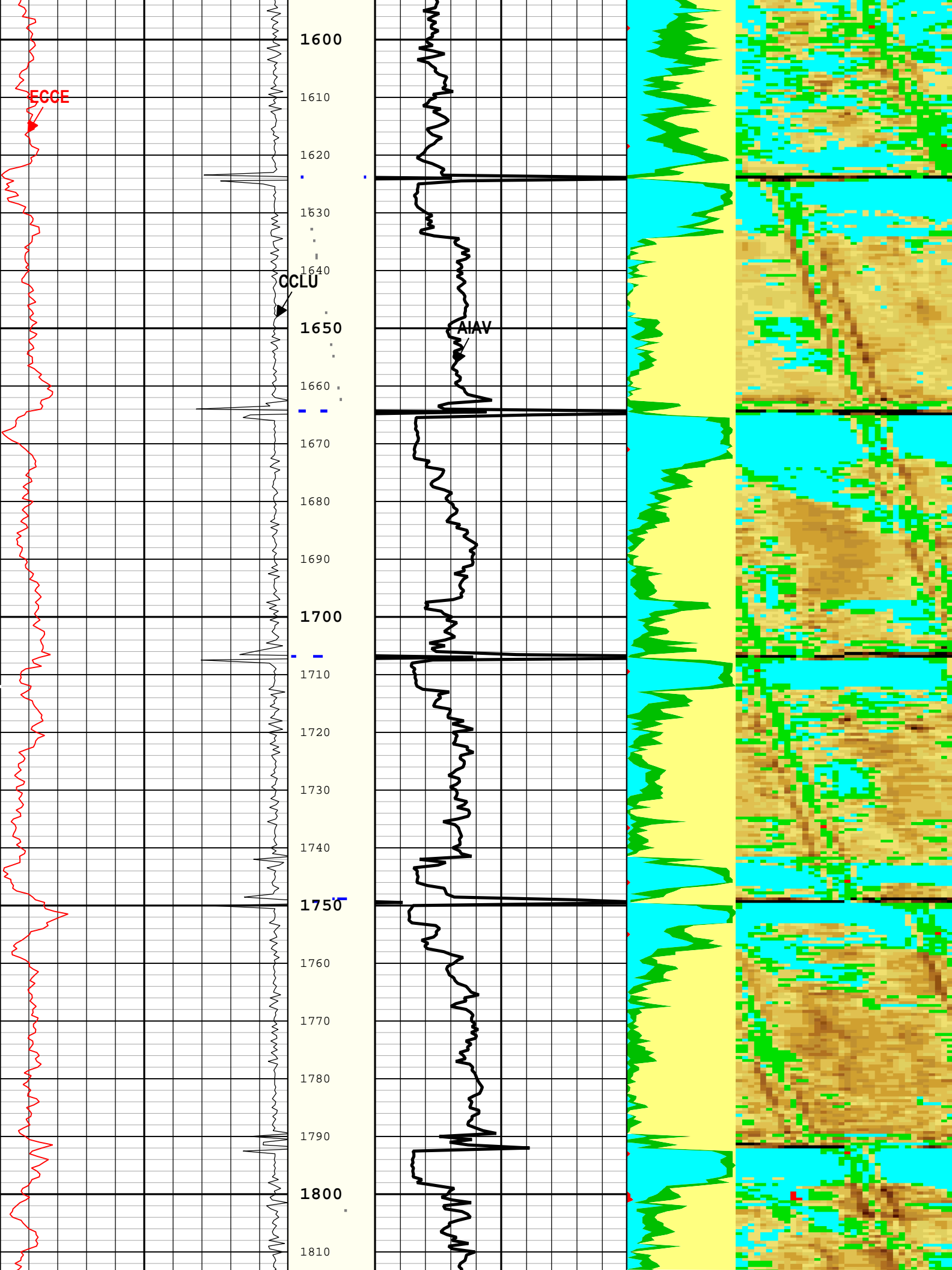


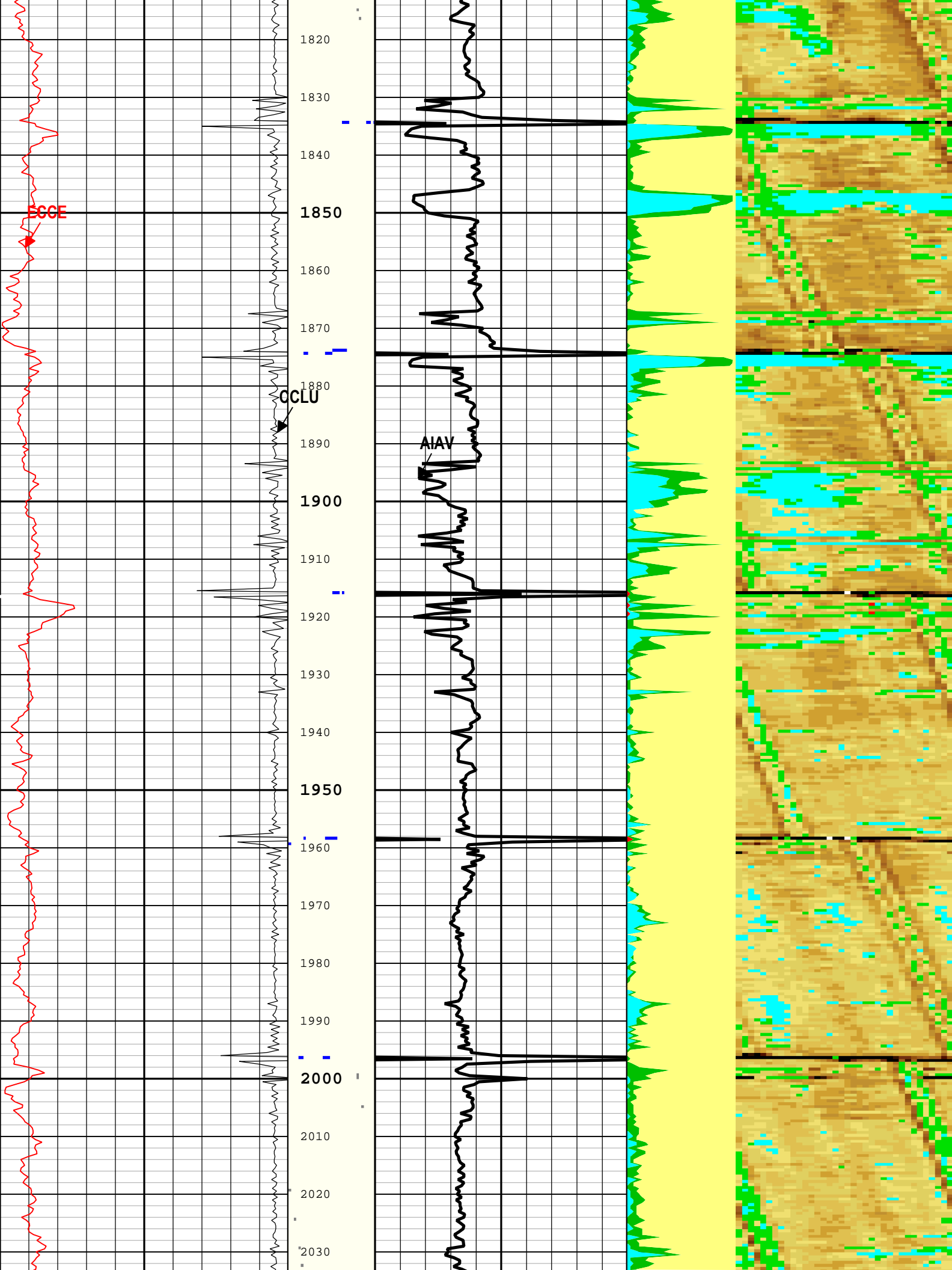


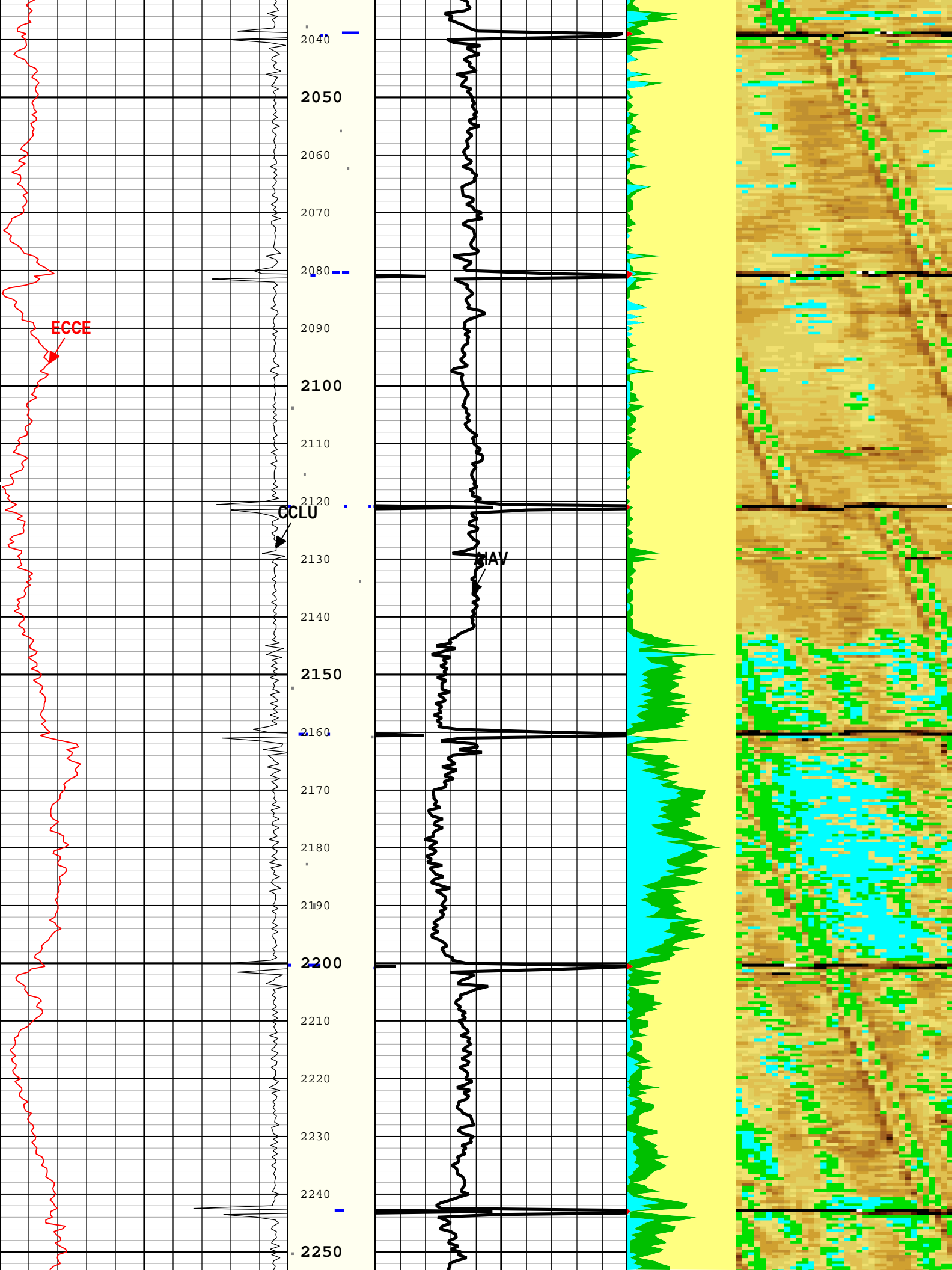


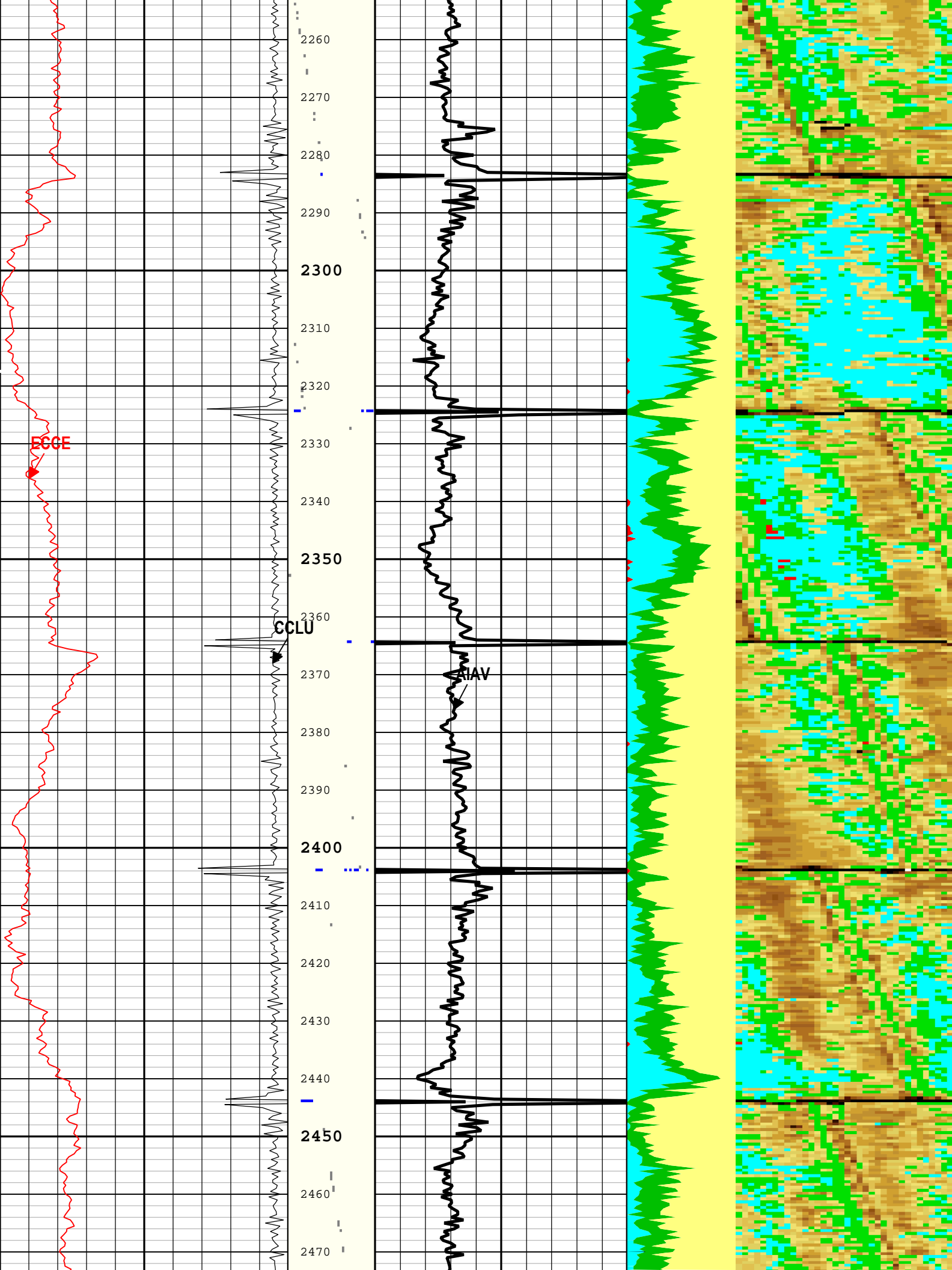




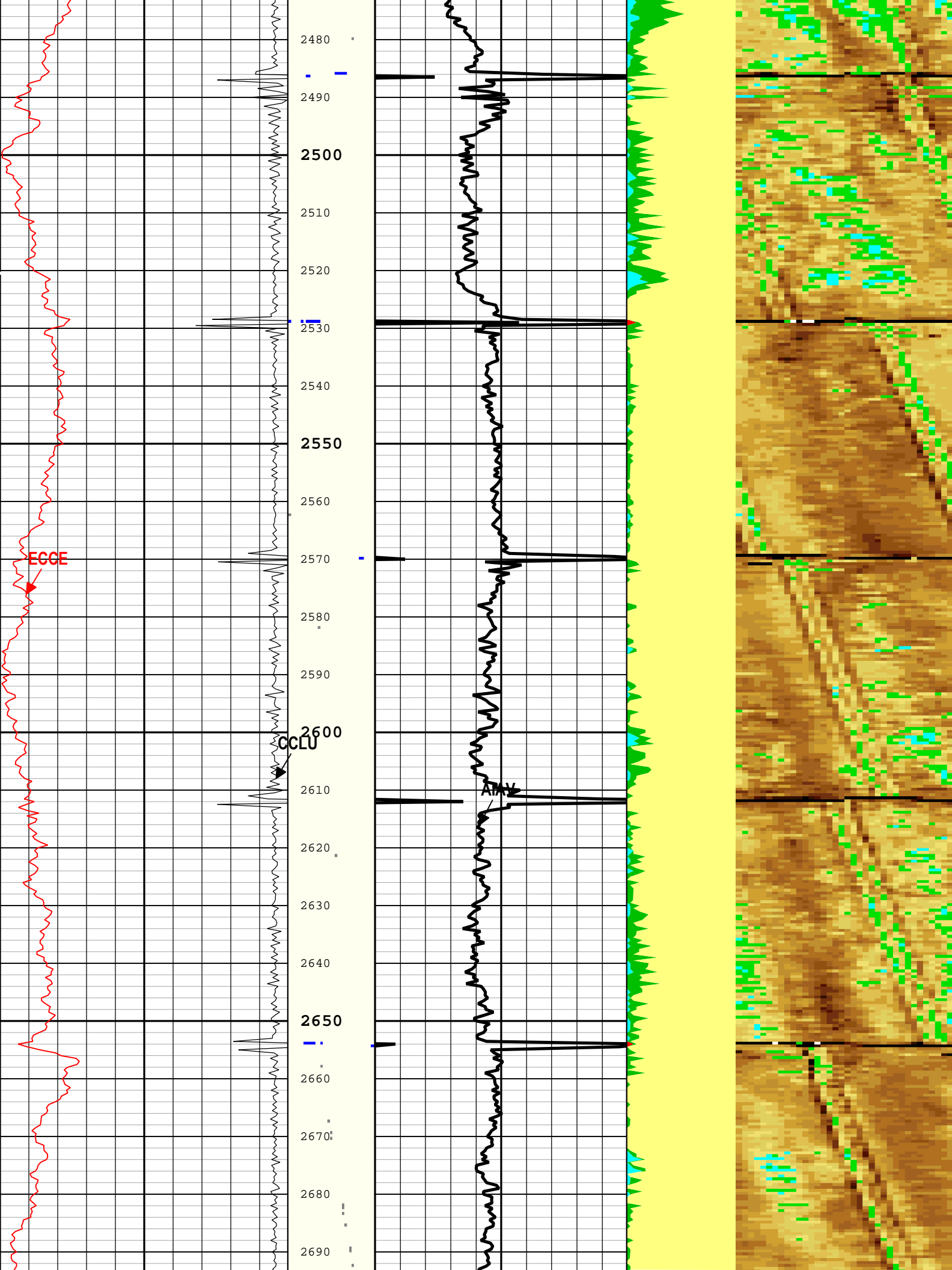


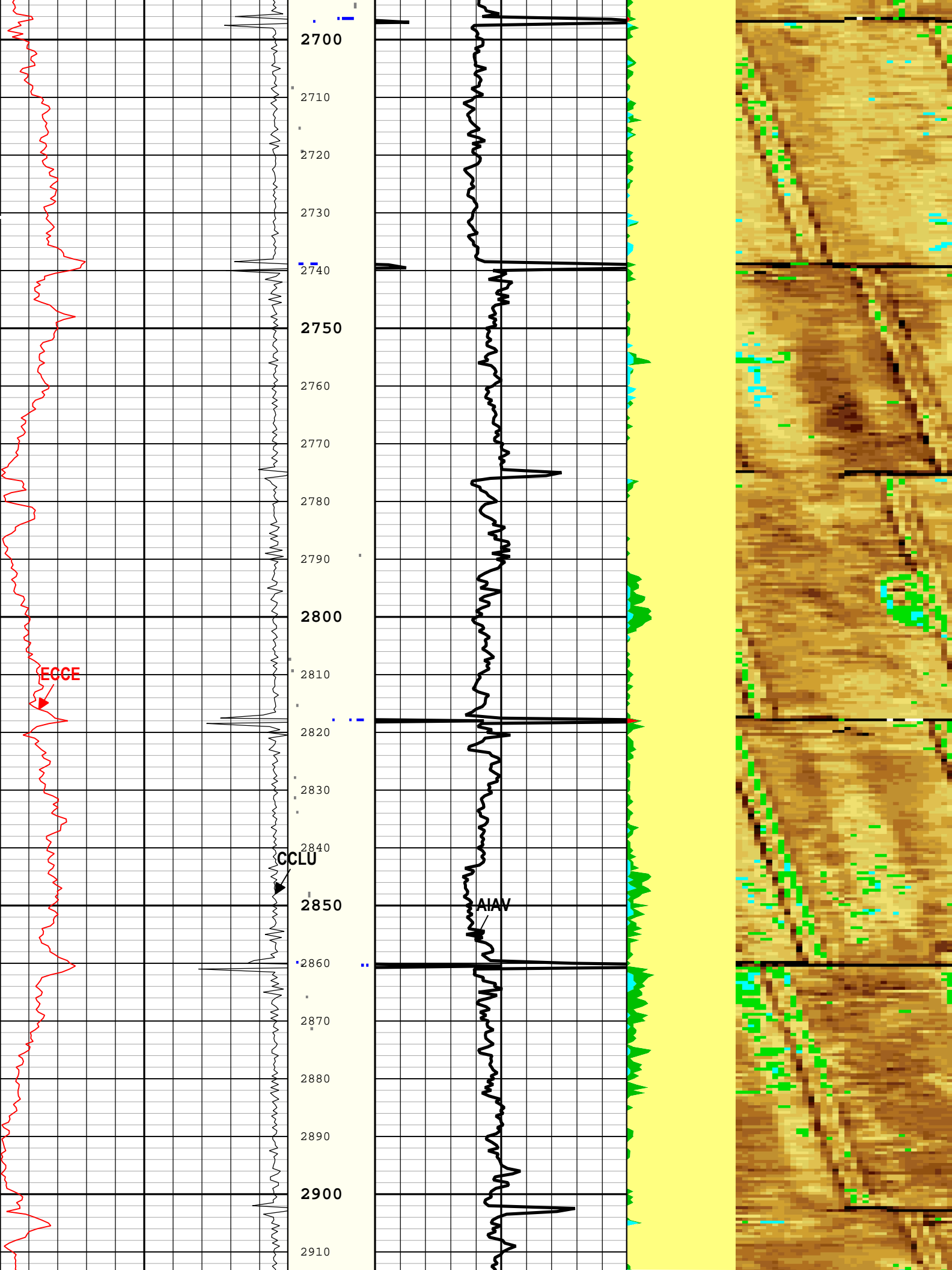


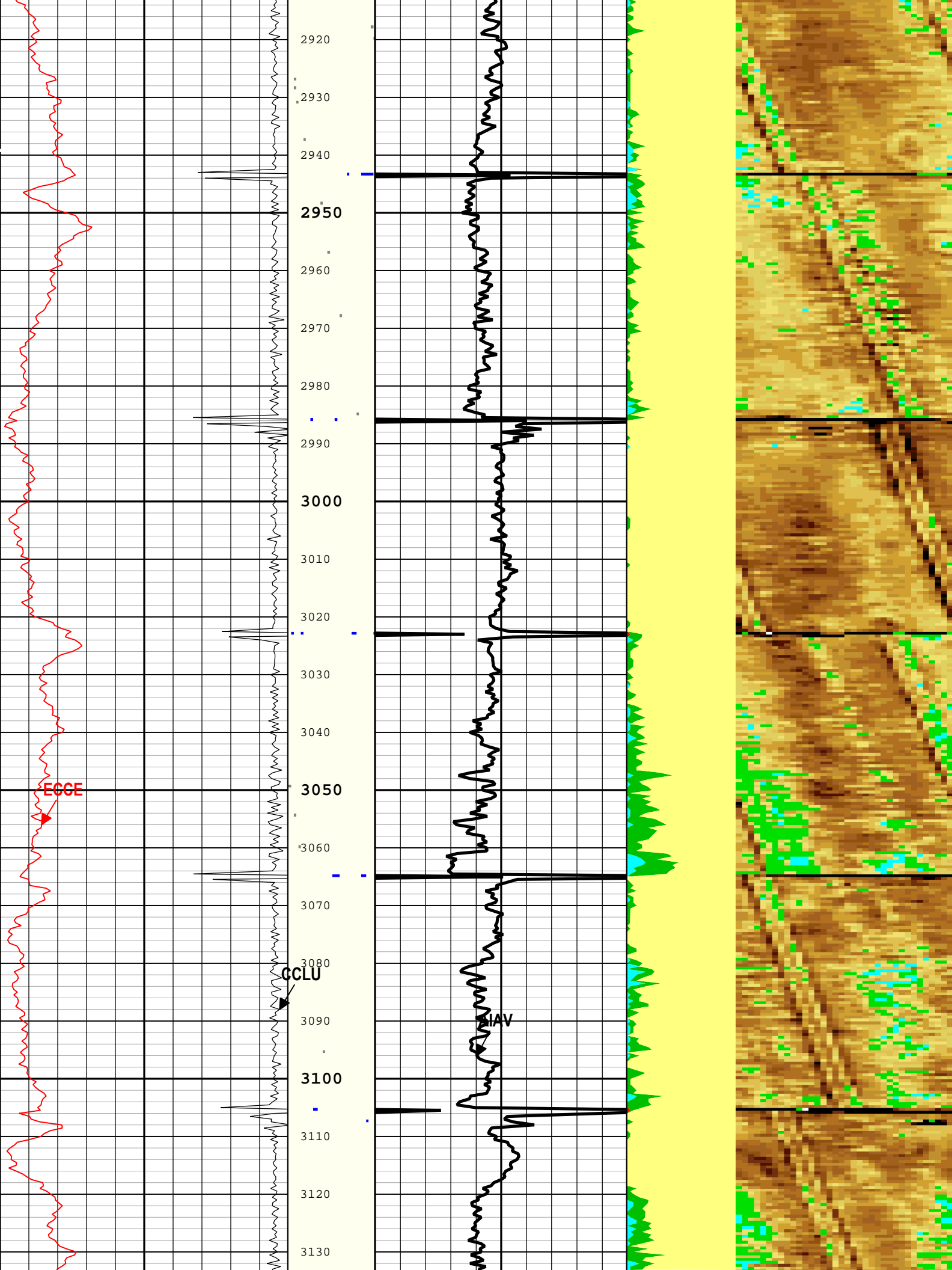


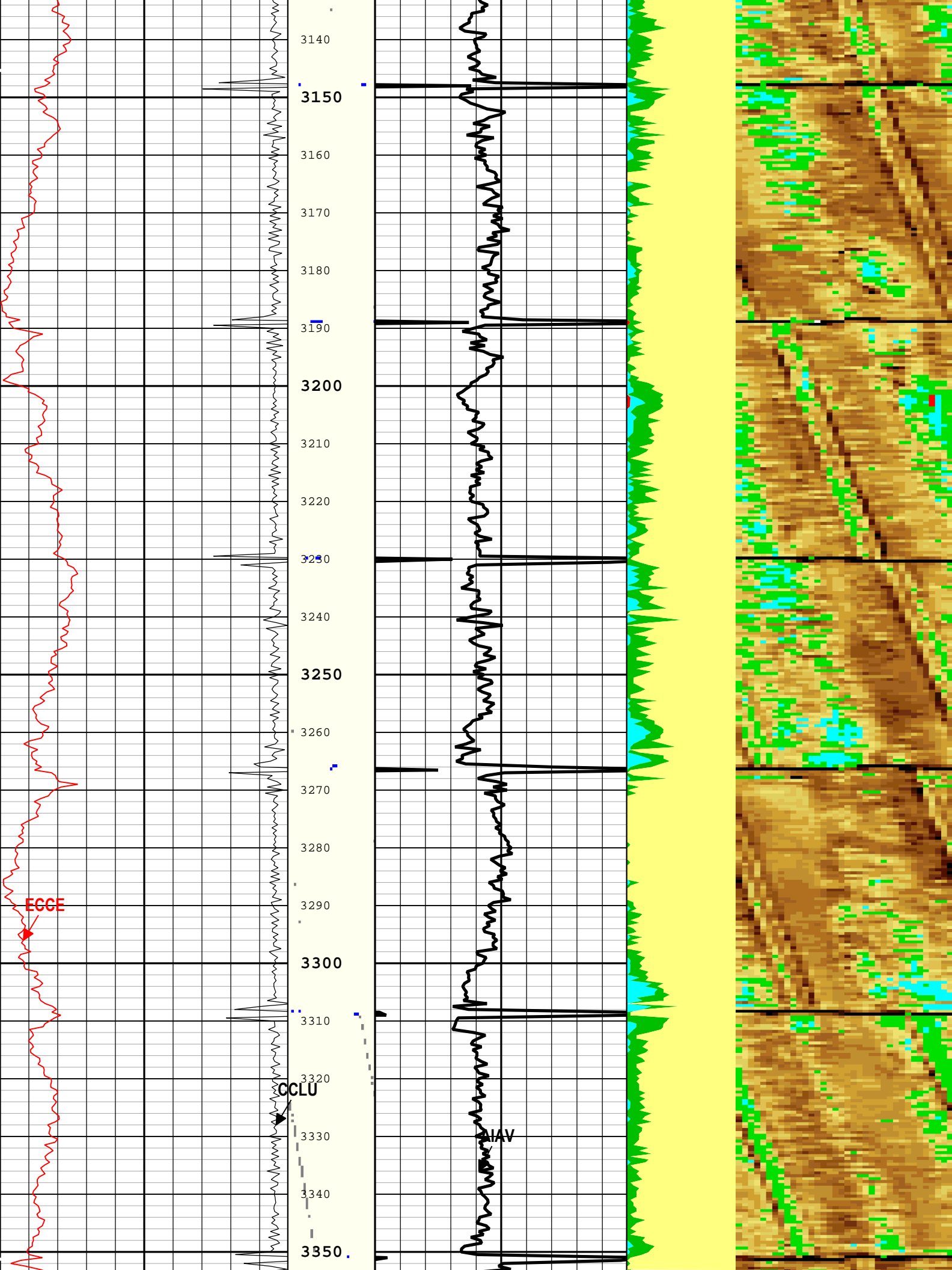


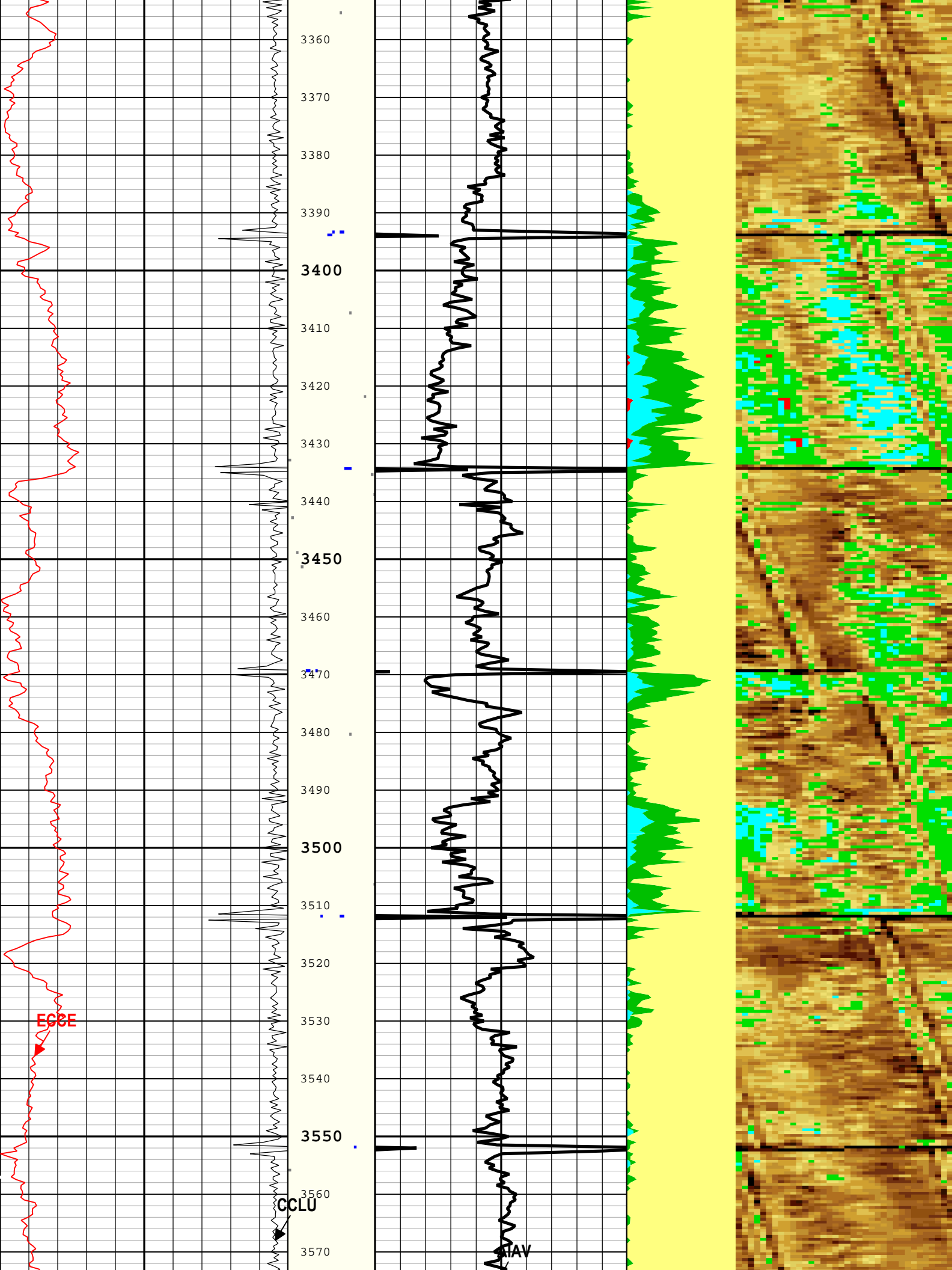


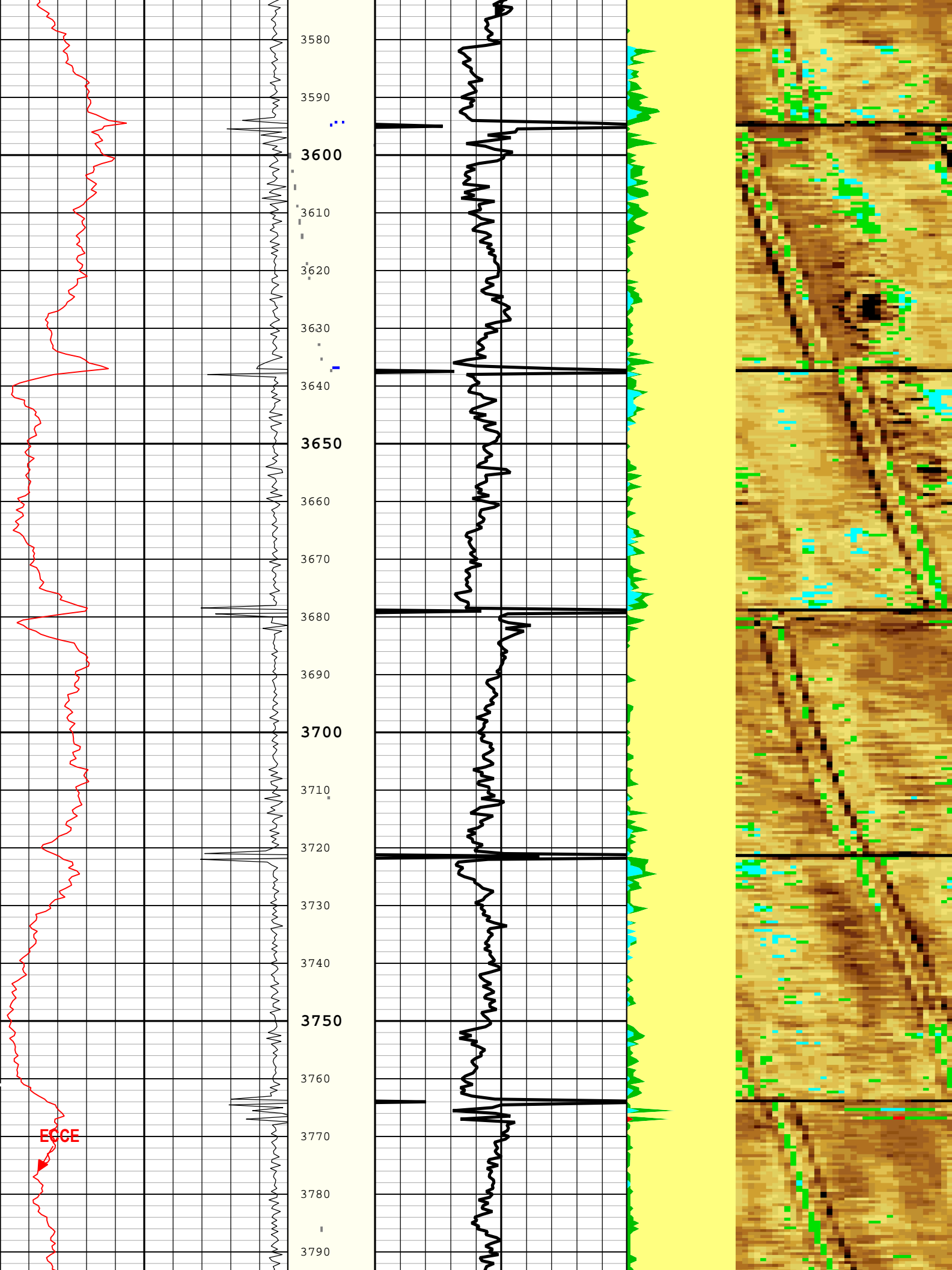


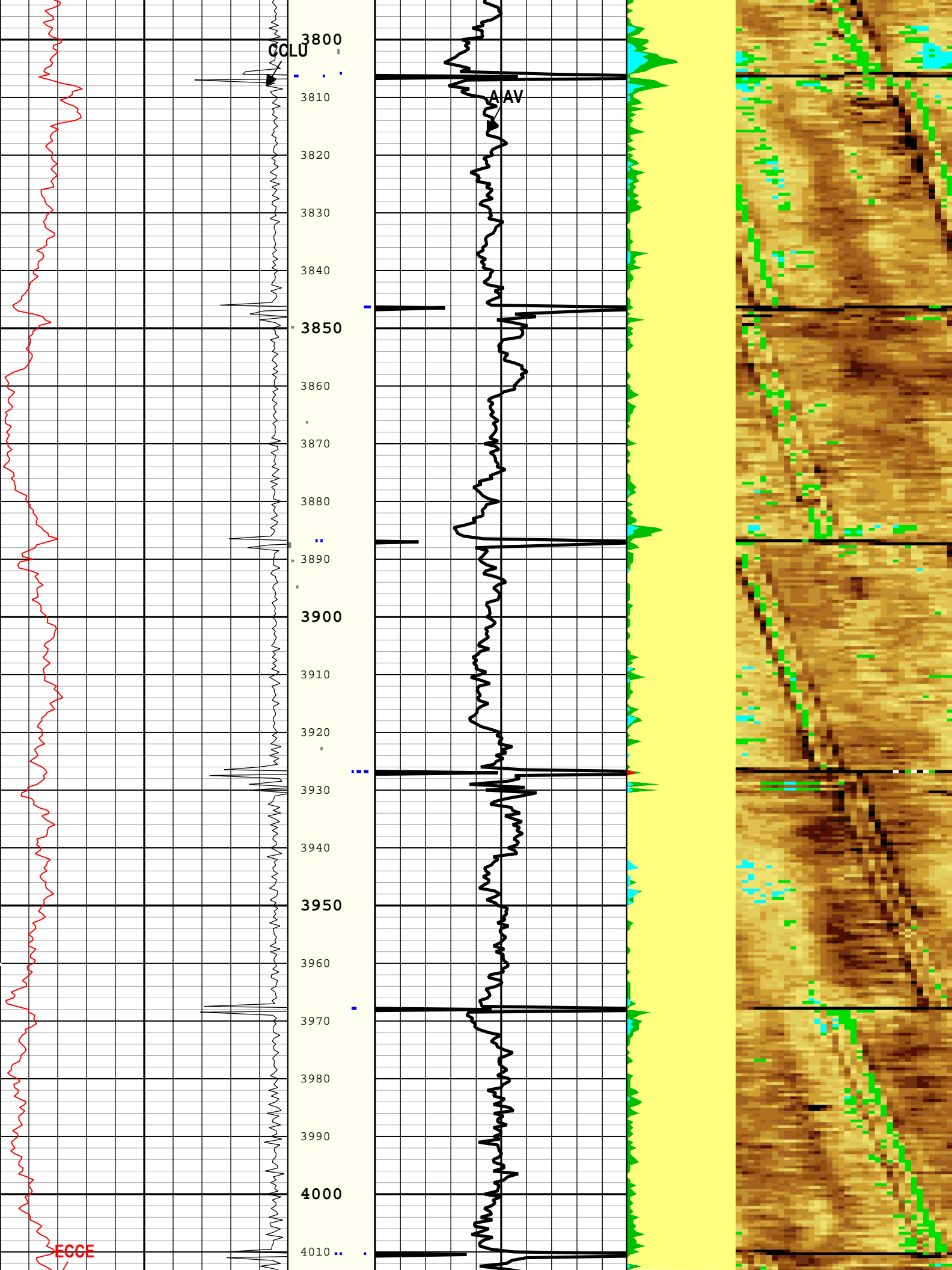


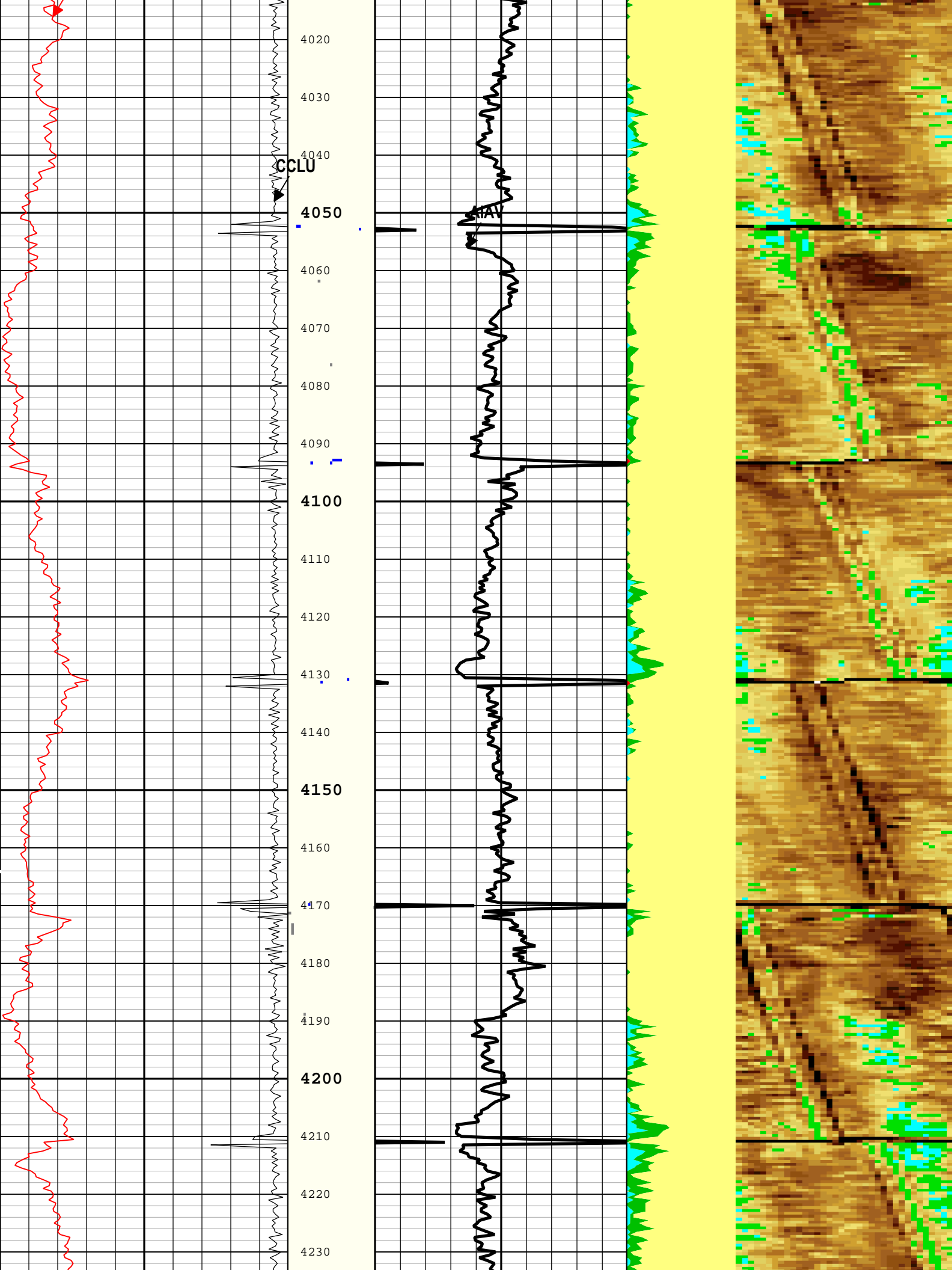




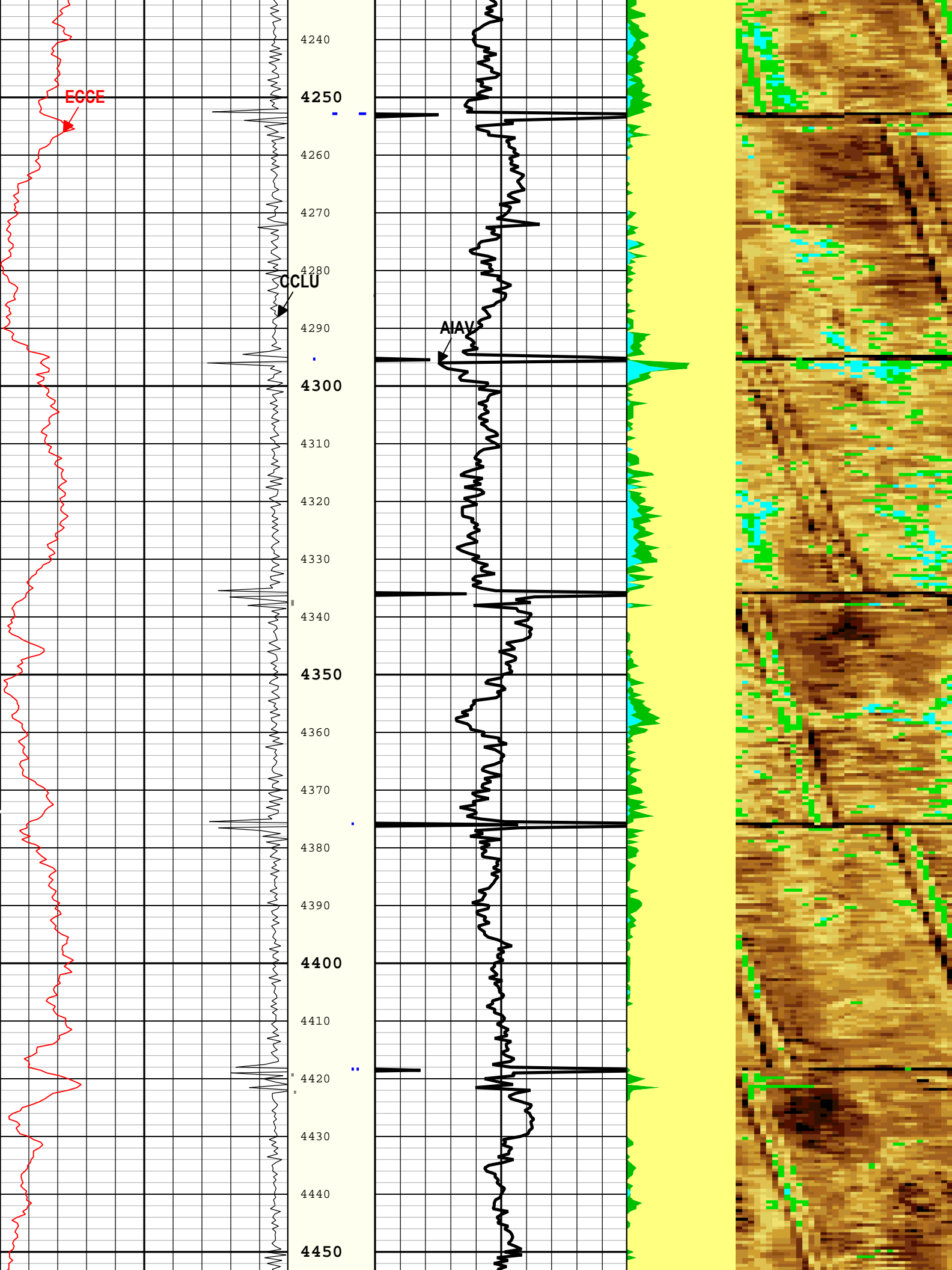


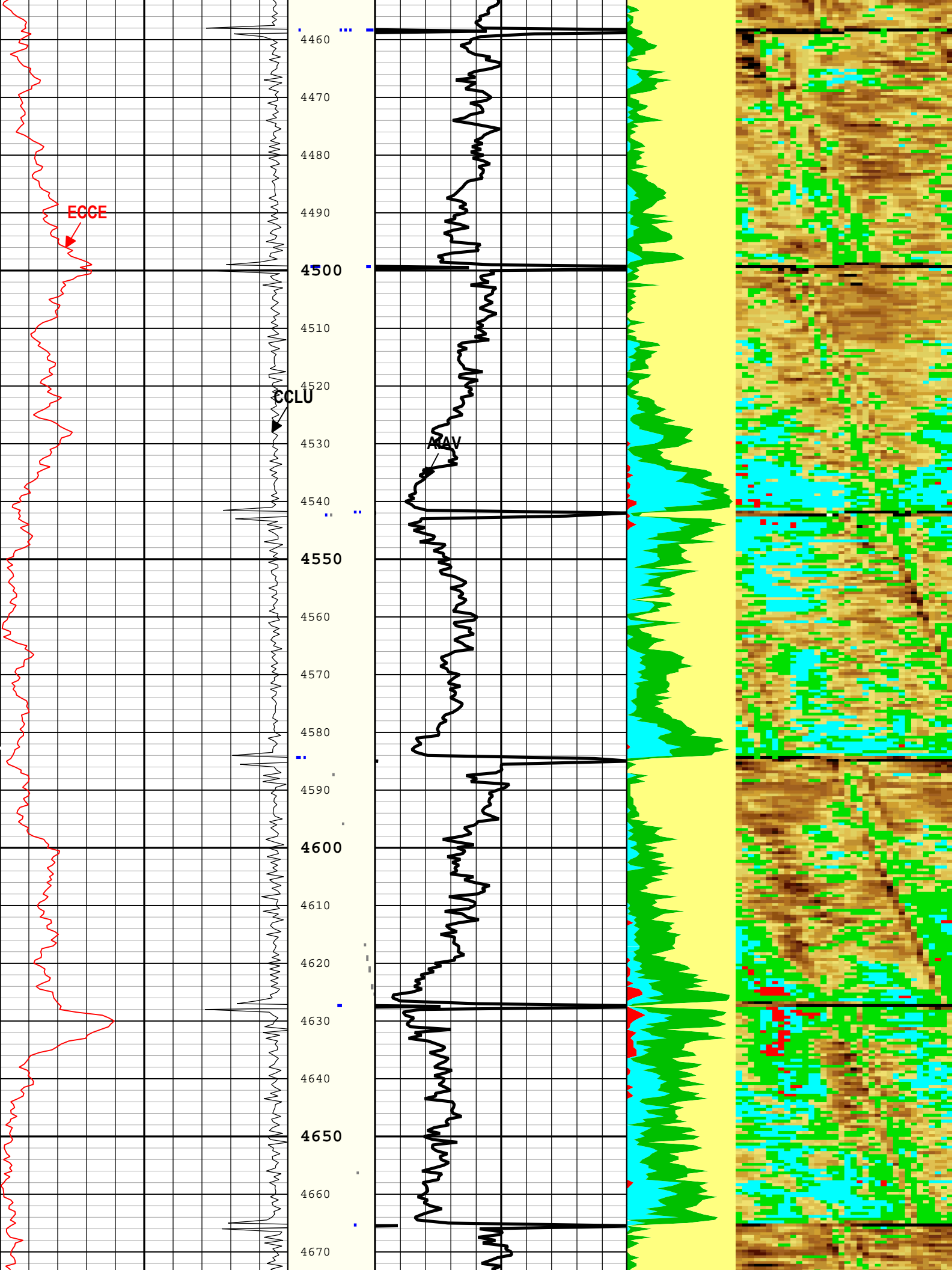


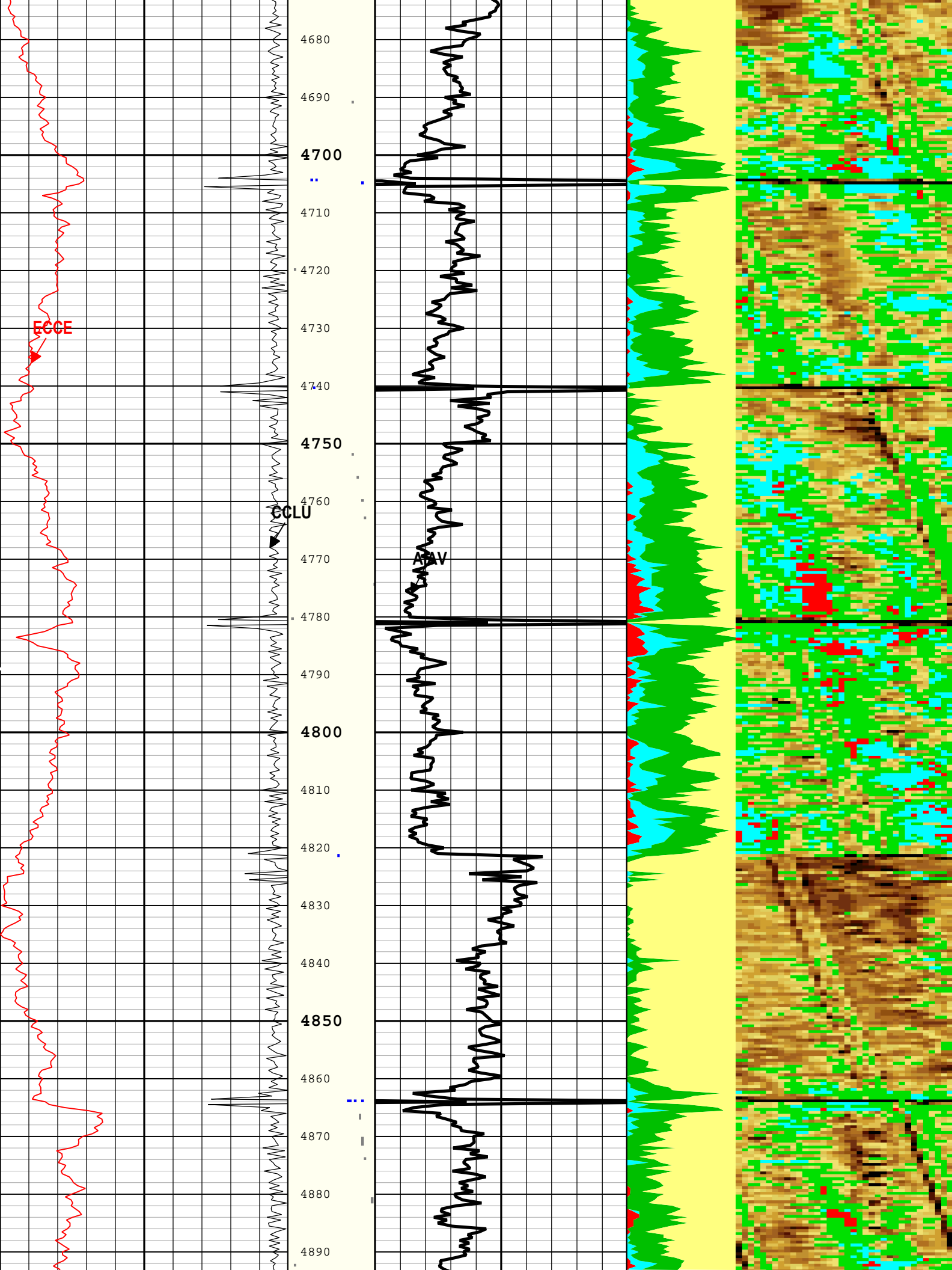


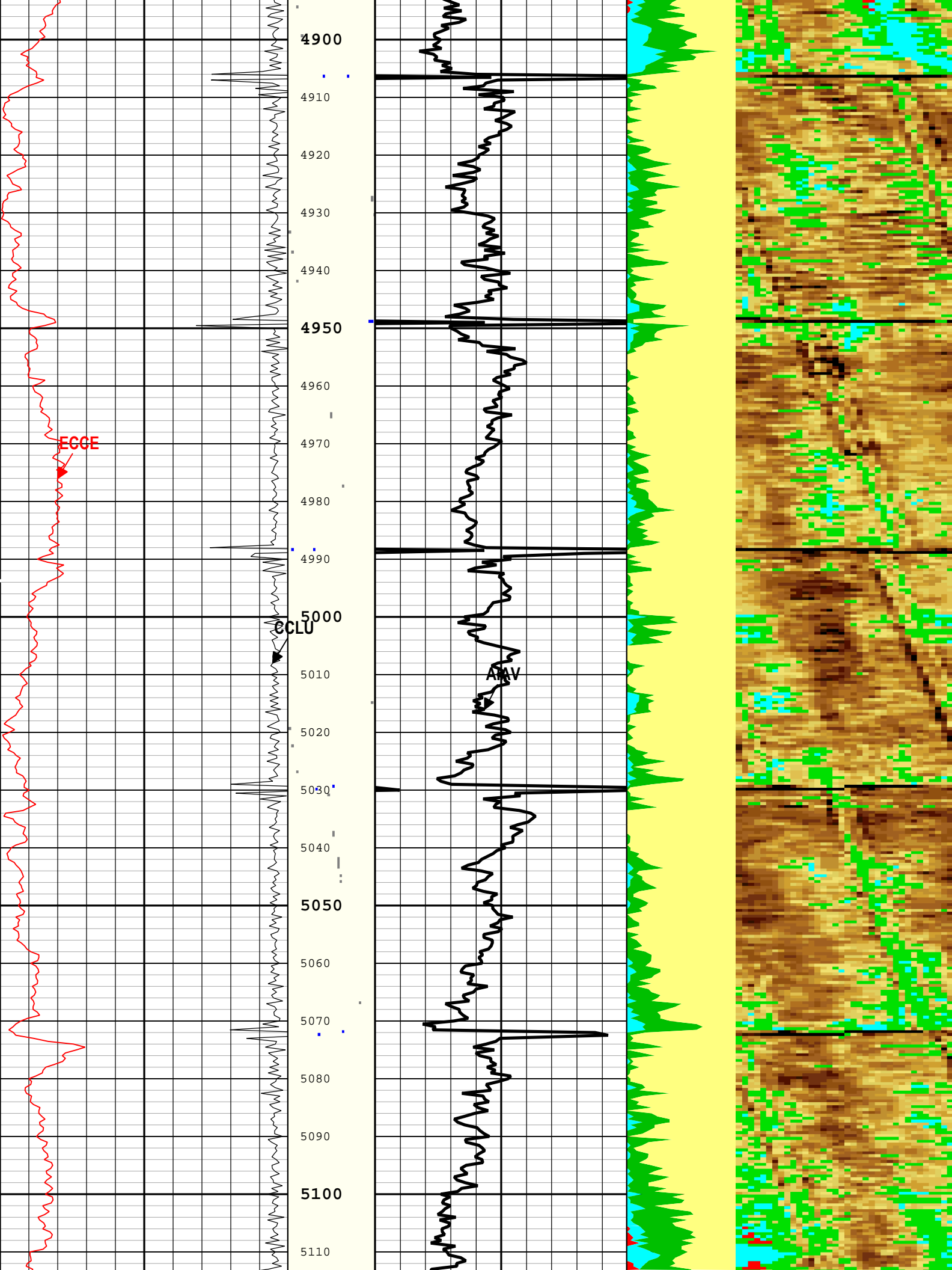


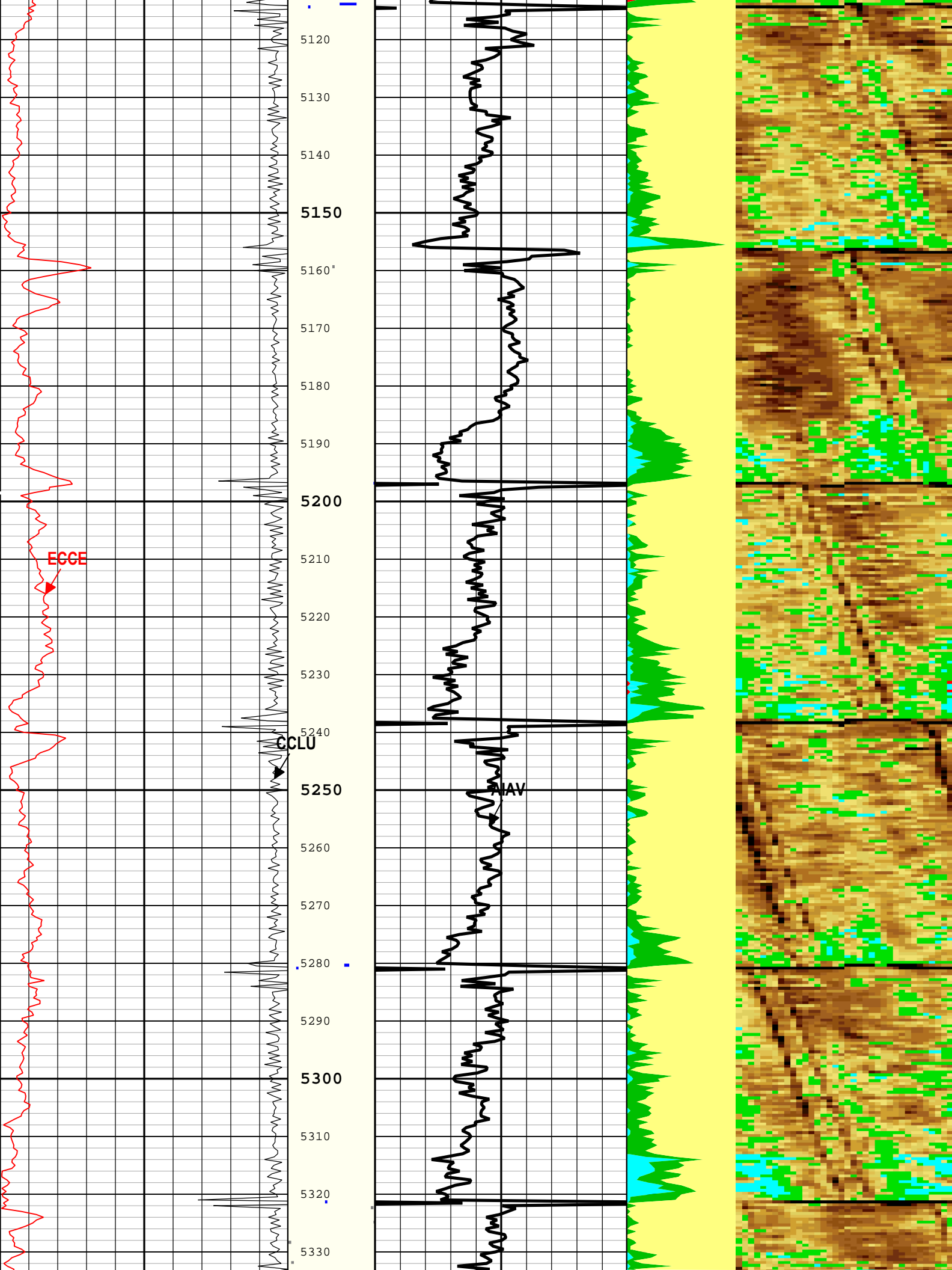


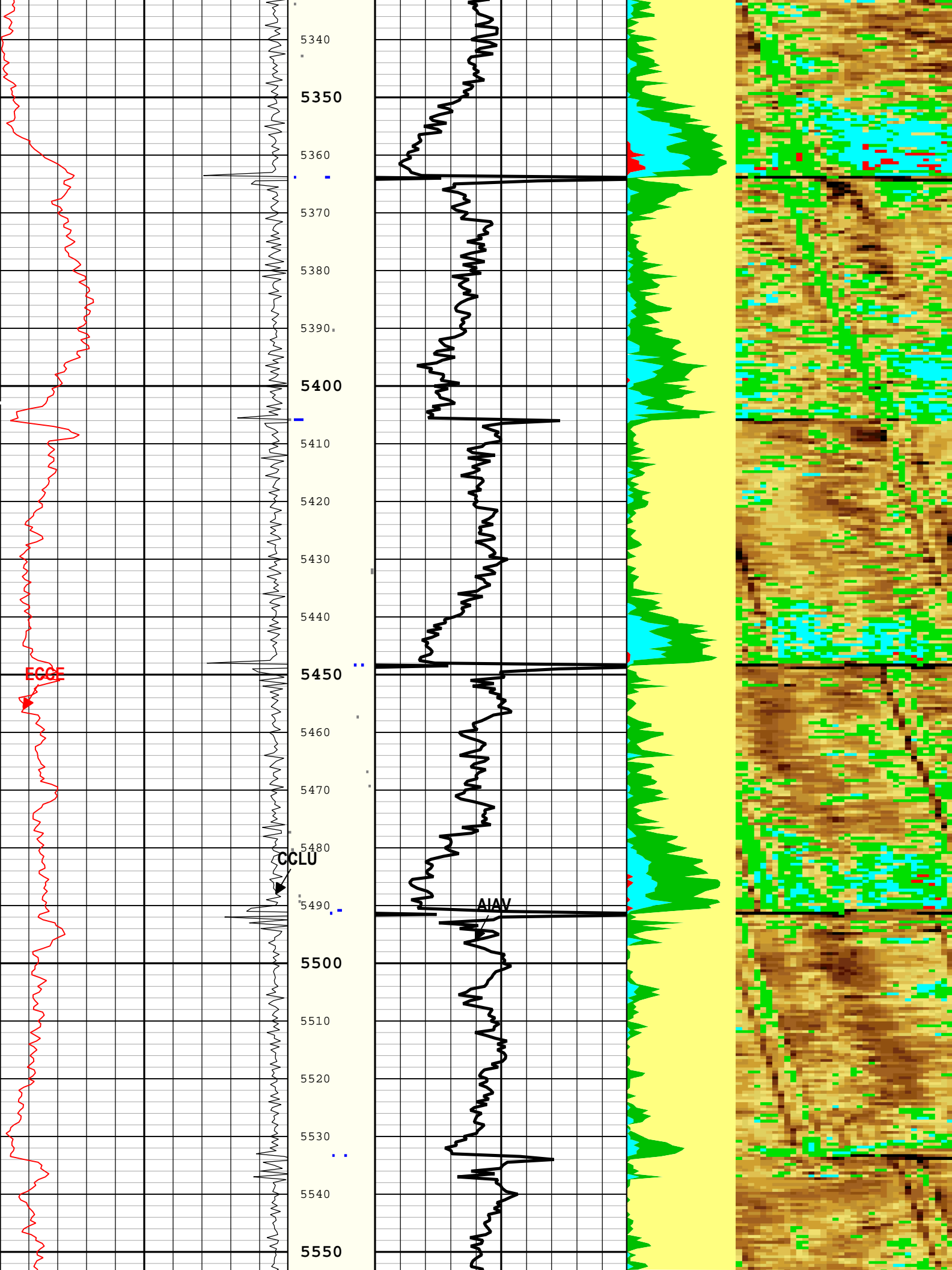


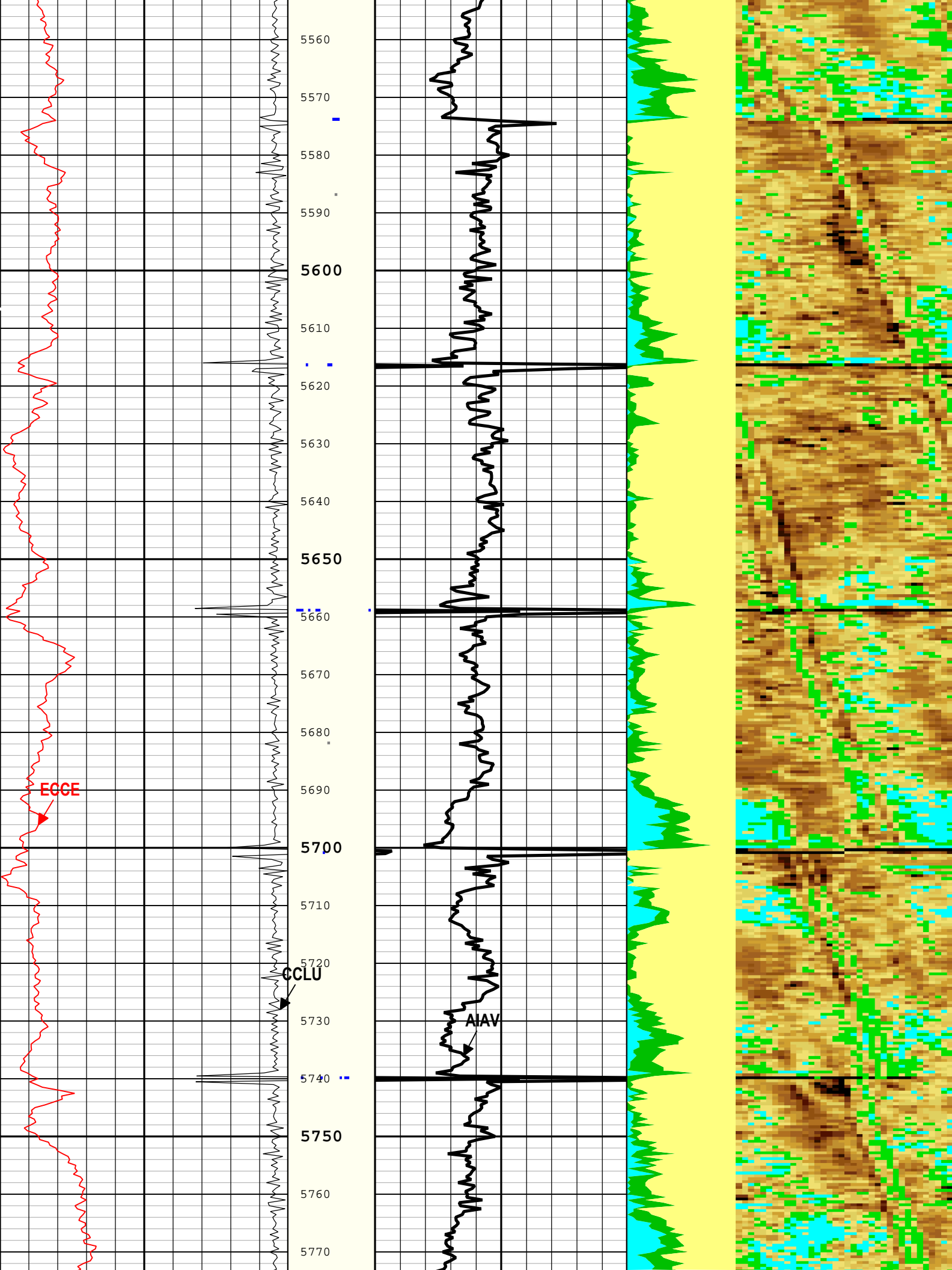


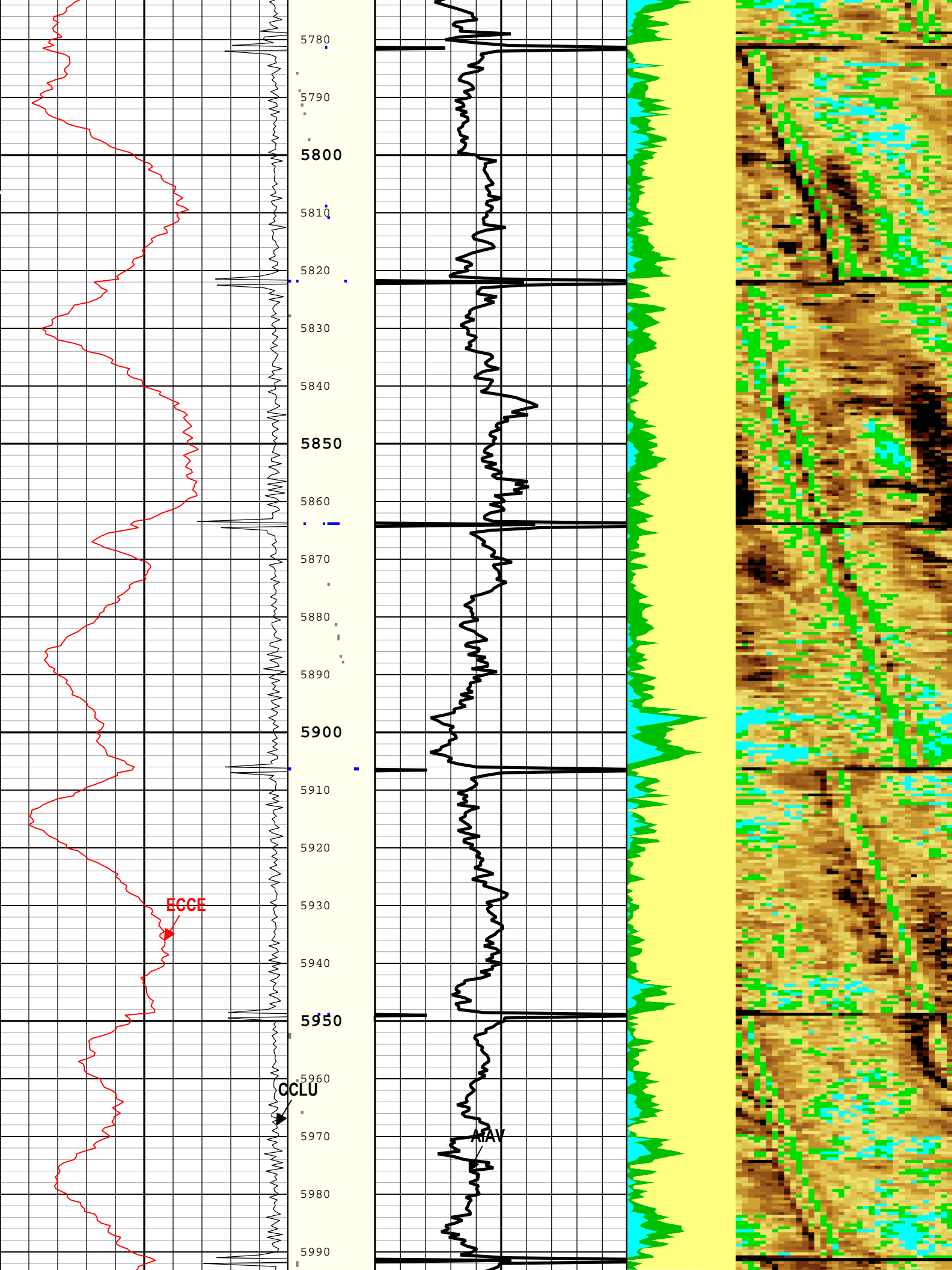




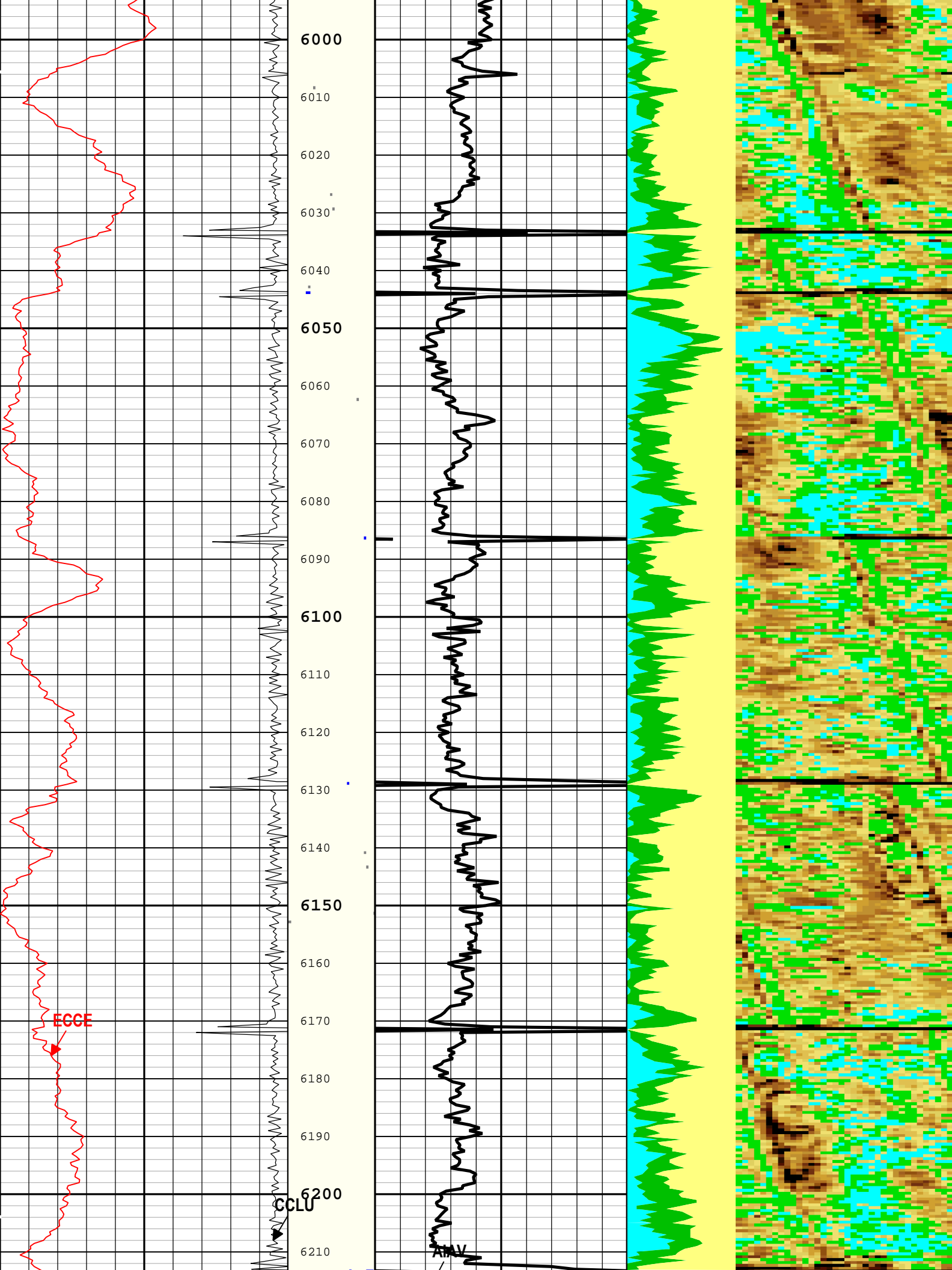


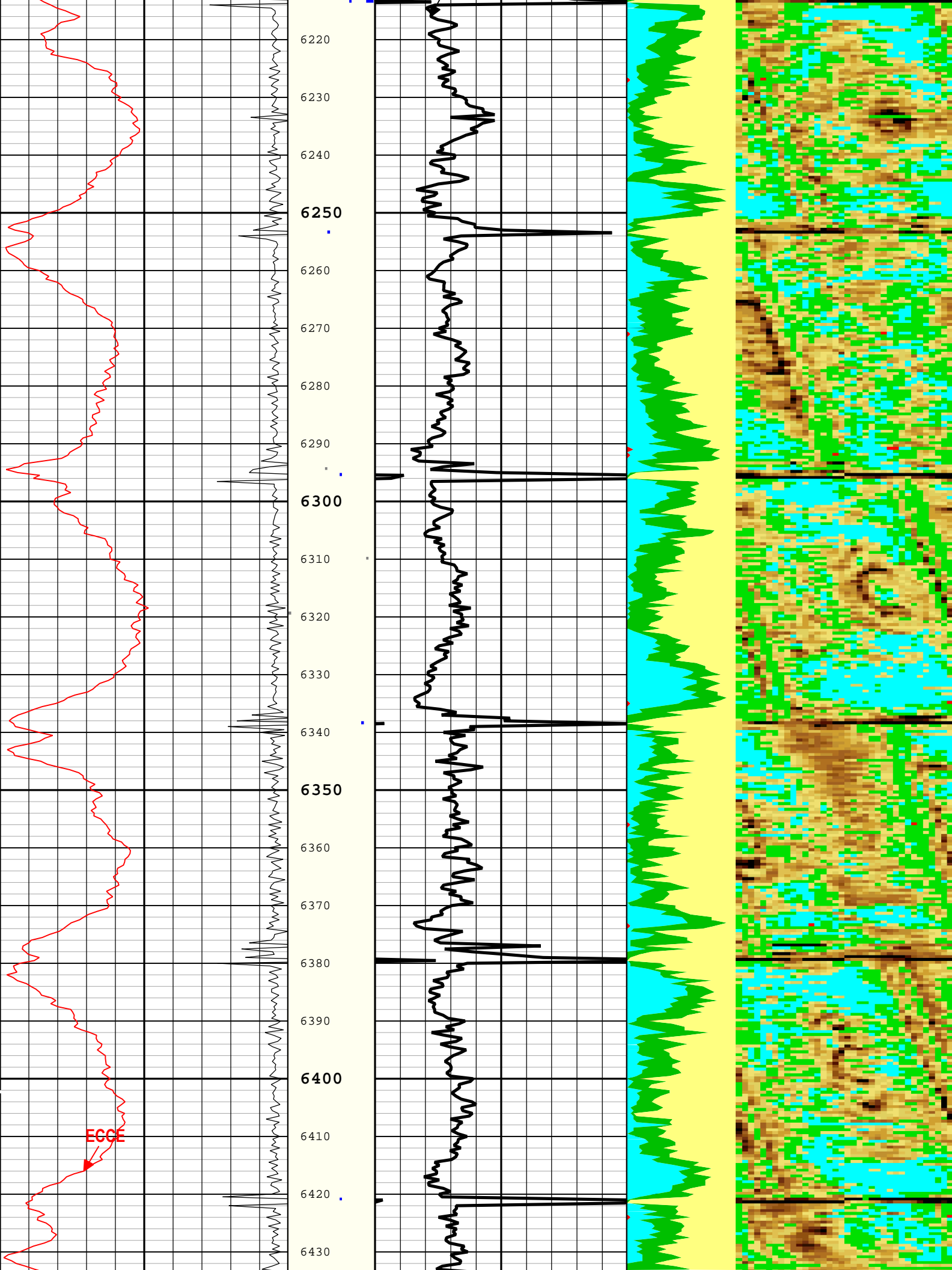


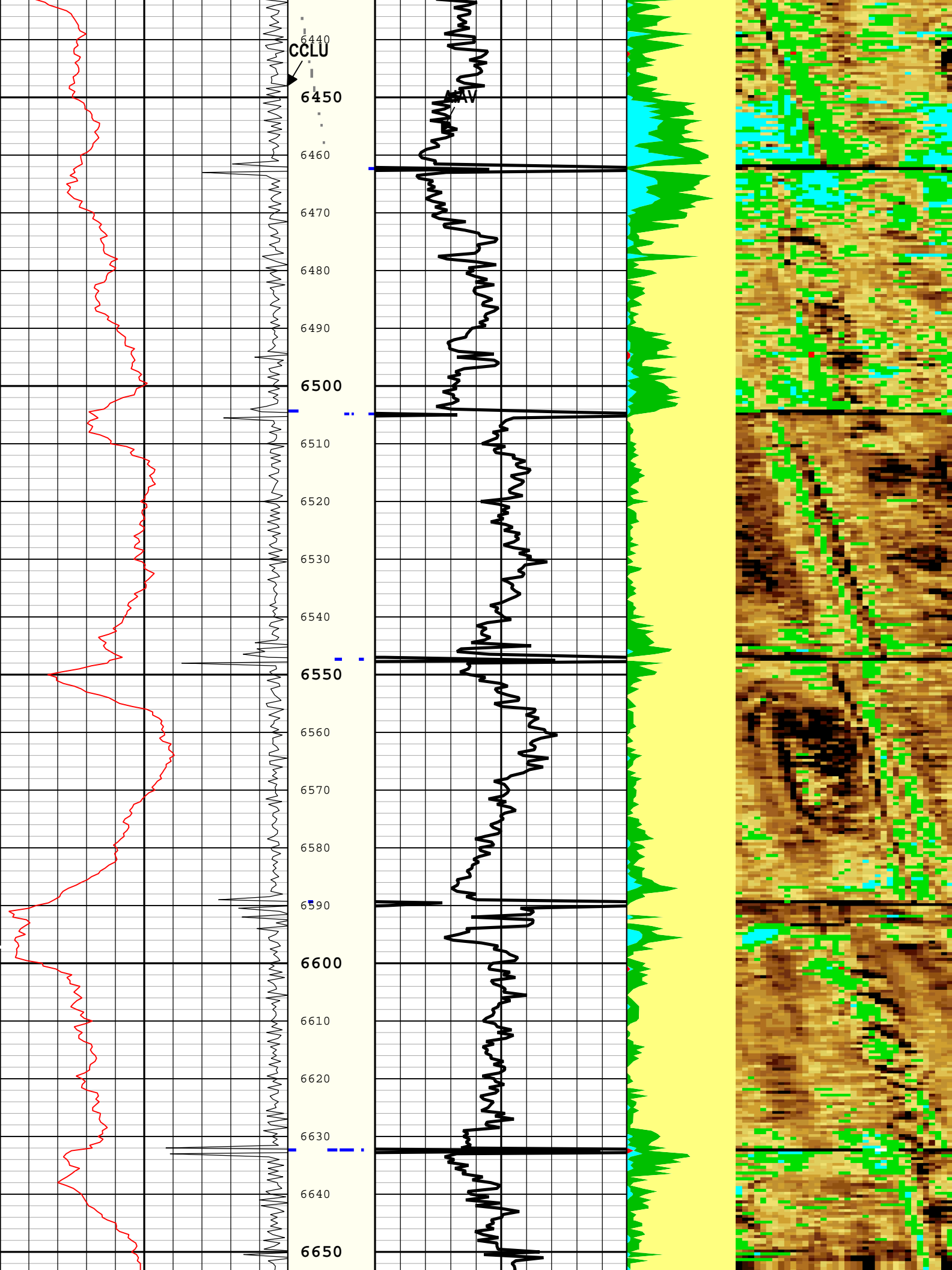






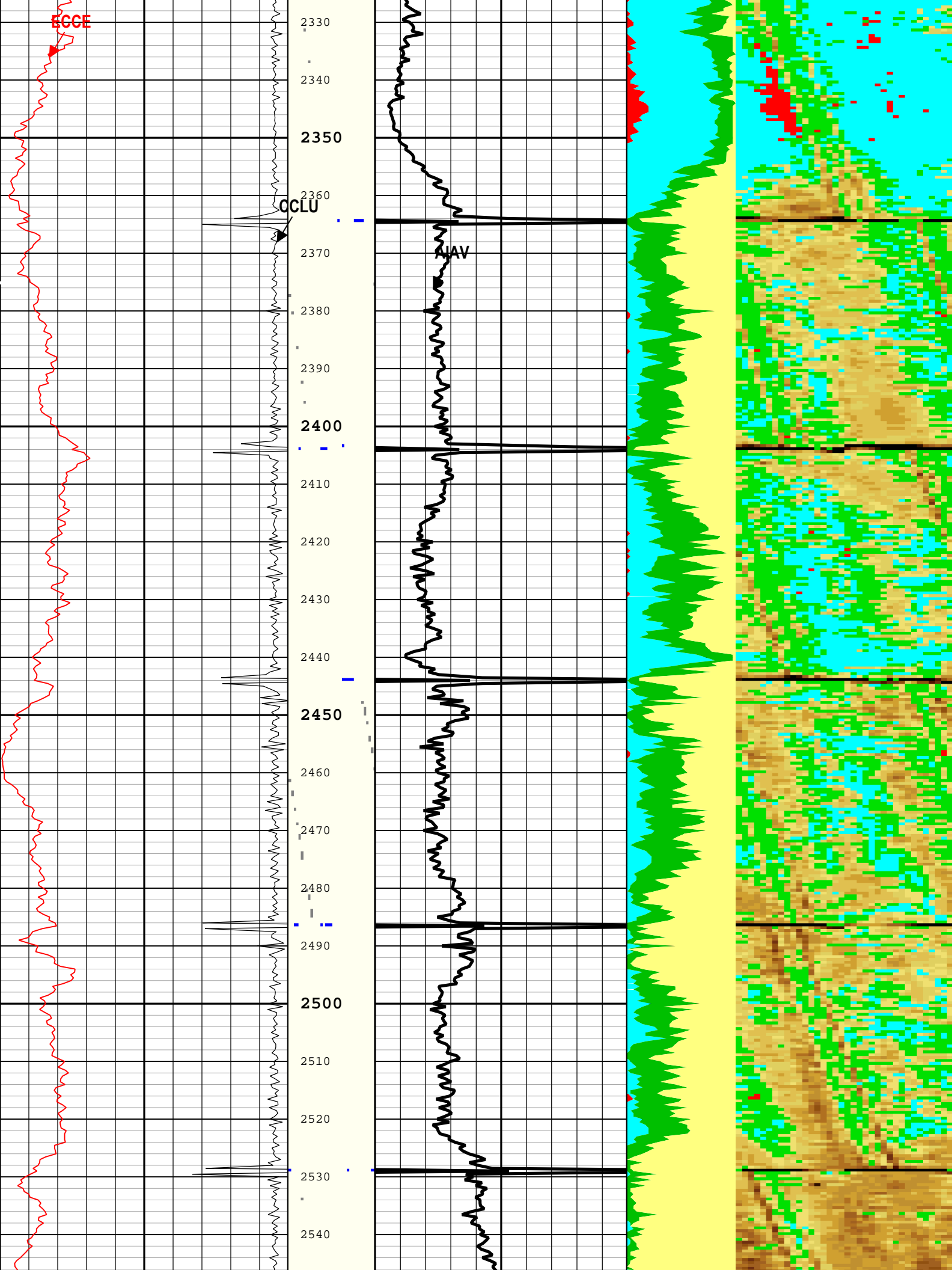


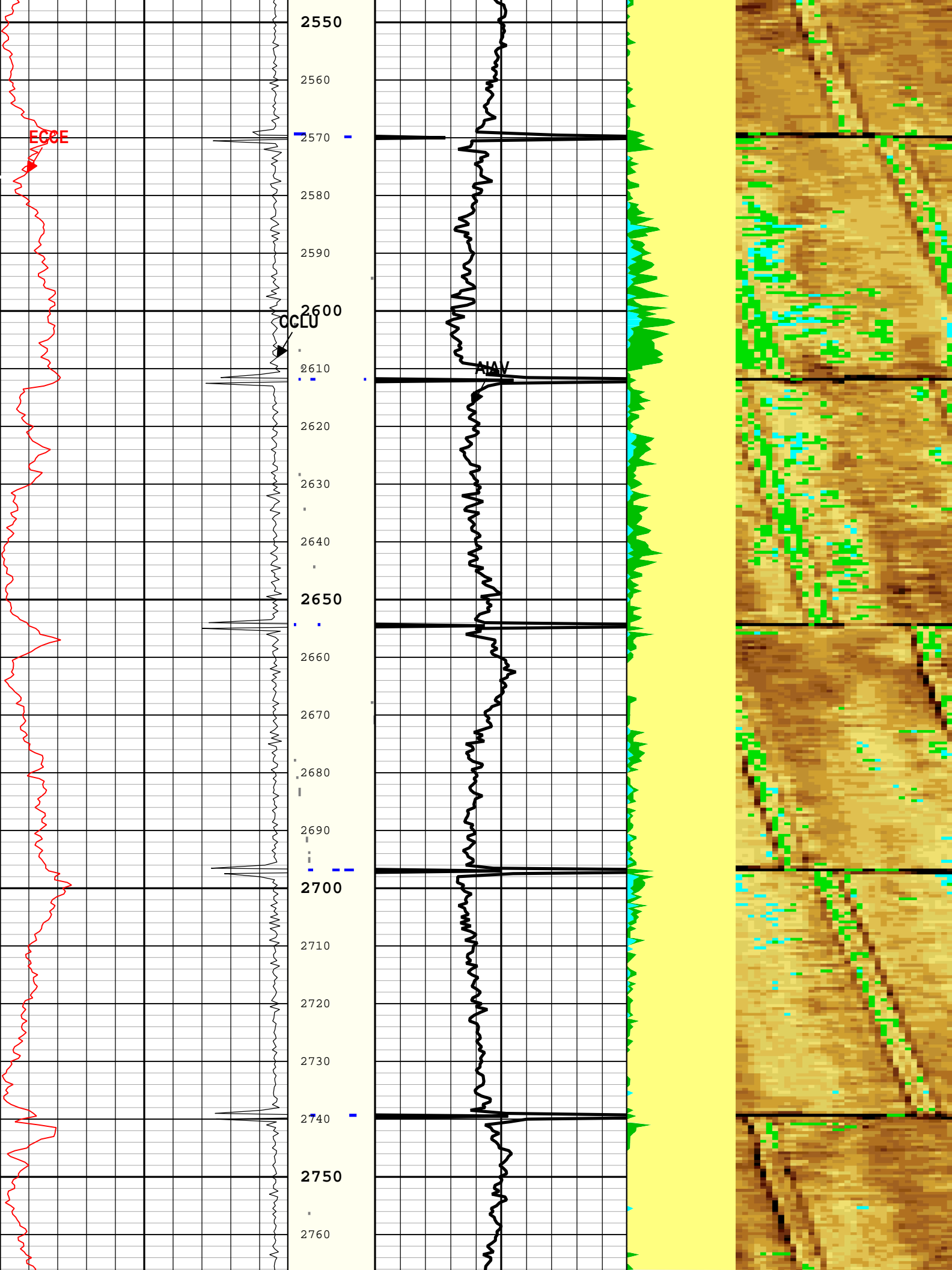


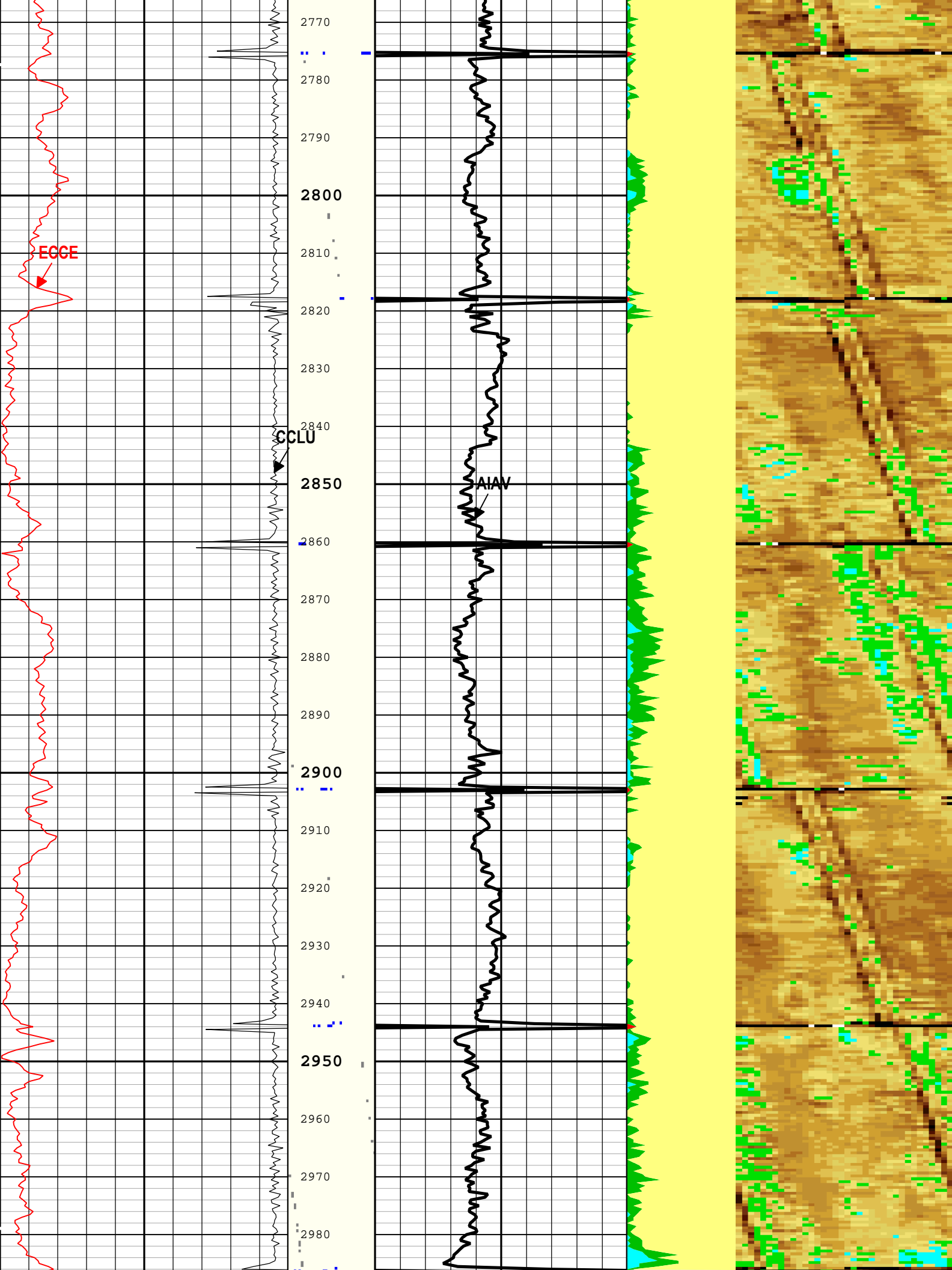




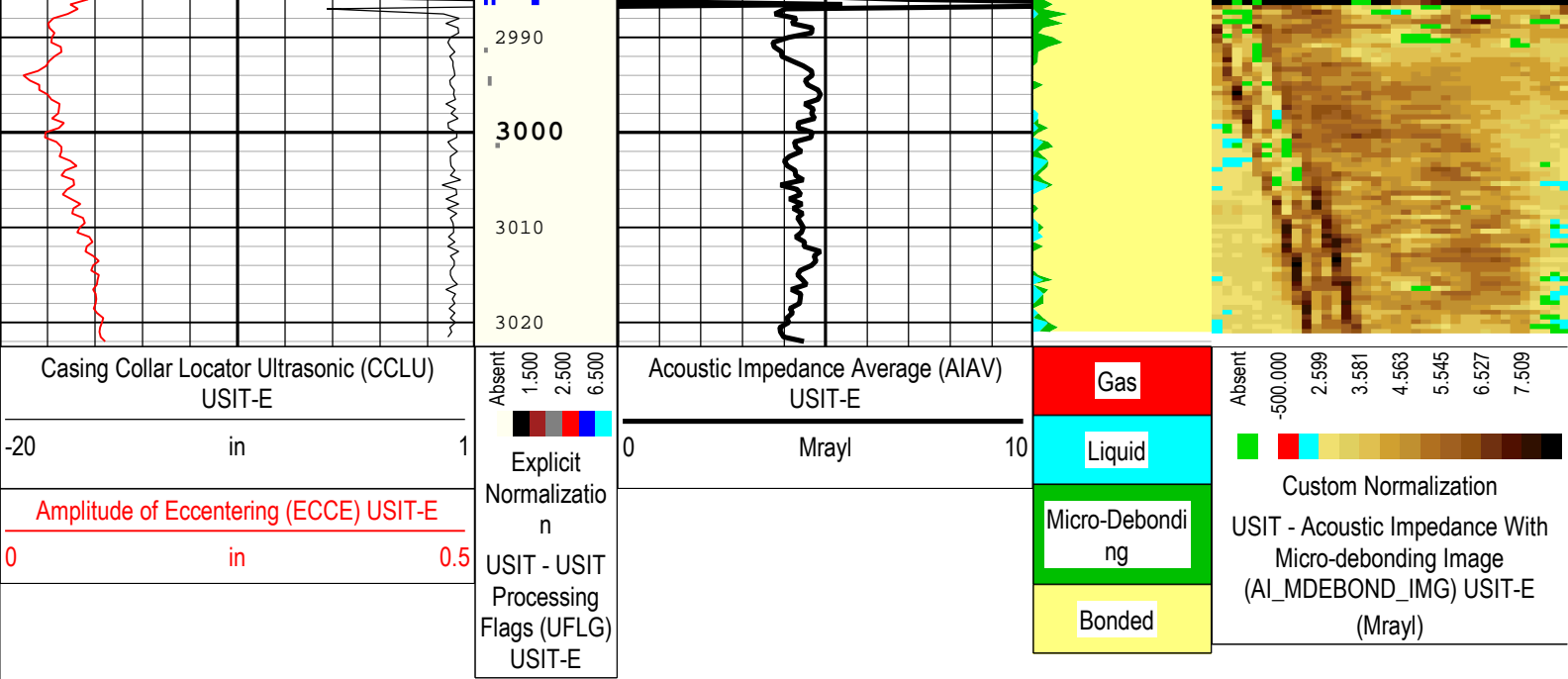












TIME\_1900 - Time Marked every 60.00 (s)

Description: Format: Log ( DJ Basin Ultrasonic Cement Summary Report ) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth  
Creation Date: 29-Jun-2016 12:44:50

## Channel Processing Parameters

### One: Parameters

| Parameter         | Description  | Tool      | Value          | Unit    |
|-------------------|--|-----------|----------------|---------|
| ISSBAR            | Barite Mud Presence Flag                           | Borehole  | No             |         |
| BS                | Bit Size   | WLSESSION | 8.5            | in      |
| CMTY(U-USIT_CENT) | Cement Type  | USIT-E    | Regular Cement |         |
| DFD               | Drilling Fluid Density                             | Borehole  | 8.4            | lbm/gal |
| DFT               | Drilling Fluid Type                                | Borehole  | Water          |         |
| DTMD              | Borehole Fluid Slowness                            | Borehole  | 190            | us/ft   |
| FDII              | FPM Data Interpolation Interval                    | USIT-E    | 0              | ft      |
| HEMA              | Hematite Presence Flag                             | Borehole  | No             |         |
| ICE_PROCESS       | ICE Processing                                     | USIT-E    | Yes            |         |
| IMAR              | Image Rotation                                     | USIT-E    | Off            |         |
| MEAS_WLEN         | Tcube Processing Window Length in Measurement Mode | USIT-E    | 22.44          | us      |
| MUD_N_FRP         | Free Pipe Mud Normalization Factor                 | USIT-E    | 1.17           |         |
| U-USIT_DFSZ       | Drilling Fluid Specific Acoustic Impedance         | USIT-E    | 1.75           | Mrayl   |
| UFGDE             | Fiberglass Density                                 | USIT-E    | 16.27          | lbm/gal |
| UFGPS             | Fiberglass Processing Selection                    | USIT-E    | No             |         |
| UFGVL             | Fiberglass Velocity                                | USIT-E    | 9678.48        | ft/s    |
| USI_FSOD          | USIT USI Fluid Slowness Fits Casing Outer Diameter | USIT-E    | 0_OFF          |         |
| USI_FVEL_SEL      | USI Fluid Velocity Selection                       | USIT-E    | Automatic      |         |
| USI_ZMUD_SEL      | USI Mud Impedance Selection                        | USIT-E    | FreePipe Norm. |         |
| ZMUD              | Acoustic Impedance of Mud                          | Borehole  | 1.78           | Mrayl   |
| ZTCM              | Acoustic Impedance Threshold for Cement            | USIT-E    | 2.6            | Mrayl   |
| ZTGS              | Acoustic Impedance Threshold for Gas               | USIT-E    | 0.3            | Mrayl   |

## Tool Control Parameters

### One: Parameters

| Parameter | Description               | Tool   | Value | Unit |
|-----------|---------------------------|--------|-------|------|
| AGMN      | Minimum Gain of Cartridge | USIT-E | -12   | dB   |
| AGMY      | Maximum Gain of Cartridge | USIT-E | 12    | dB   |

|               |                                      |        |                                  |    |
|---------------|--------------------------------------|--------|----------------------------------|----|
| AGMX          | Maximum Gain of Cartridge            | USIT-E | 18                               | dB |
| U-USIT_DDT5   | USIC Downhole Decimation for T5 only | USIT-E | 0_NONE                           |    |
| EMXV          | EMEX Voltage                         | USIT-E | 55                               | V  |
| HRES          | Horizontal Resolution                | USIT-E | 10 deg                           |    |
| TMUC          | Type of Mud                          | USIT-E | BRI                              |    |
| ULOG          | Logging Objective                    | USIT-E | MEASUREMENT                      |    |
| UMFR          | Modulation Frequency                 | USIT-E | 333333                           | Hz |
| USFR          | Ultrasonic Sampling Frequency        | USIT-E | 500000                           | Hz |
| UPAT          | USIT Emission Pattern                | USIT-E | Pattern 375 KHz                  |    |
| UWKM          | USIT Working Mode                    | USIT-E | Uncompressed 10 deg at 6.0 in LF |    |
| USIT_DEPTHLOG | Starting Depth Log for Ultrasonics   | USIT-E | 5000                             | ft |
| WINB          | Window Begin Time                    | USIT-E | 27.85                            | us |
| WINE          | Window End Time                      | USIT-E | 67.85                            | us |

XYZ

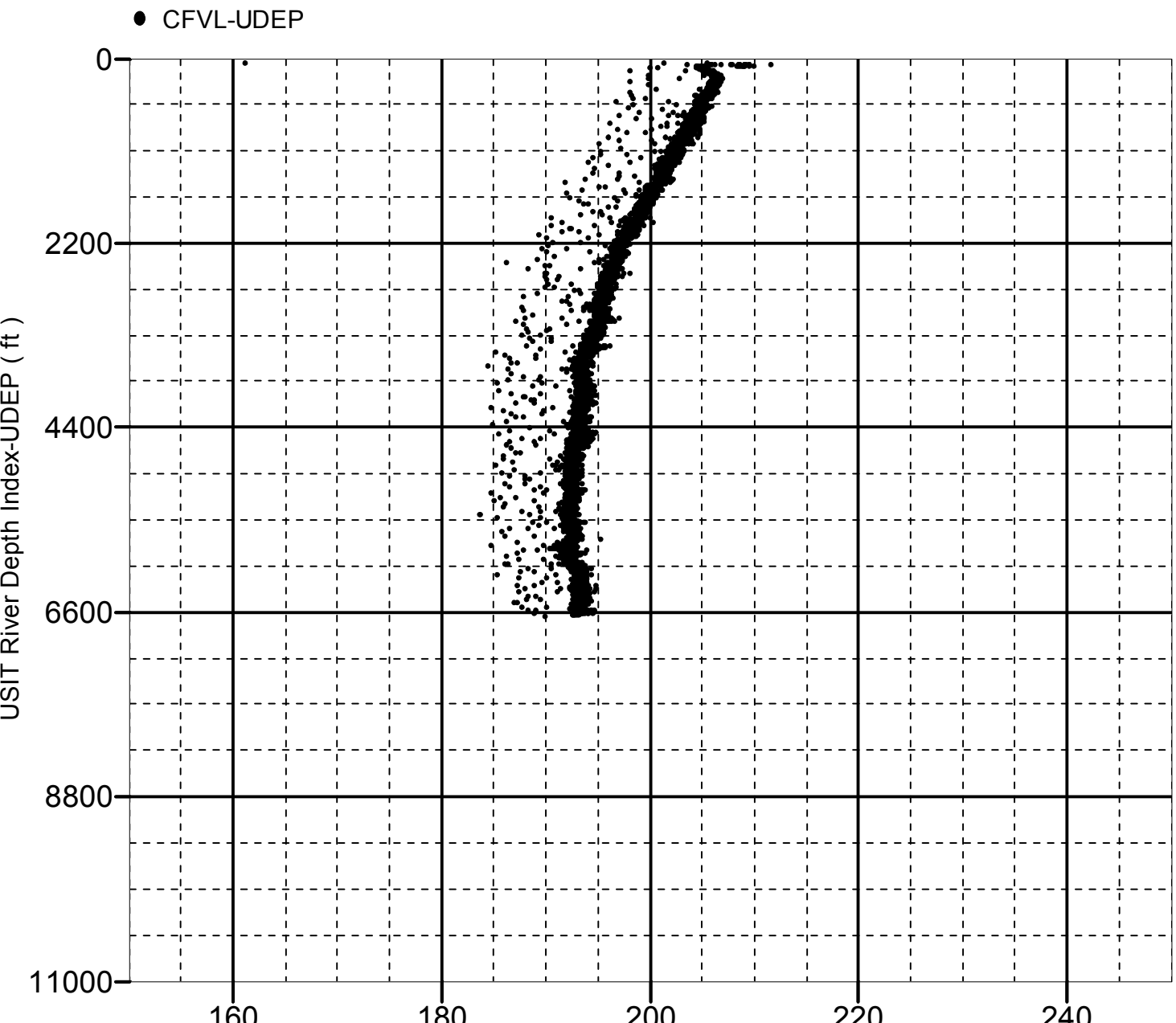
Company:Noble Energy Inc. Well:Shadow A26-656

One: Log[2]:Up:S005

# Fluid Acoustic Slow ness vs Depth

## 2D Cross Plot

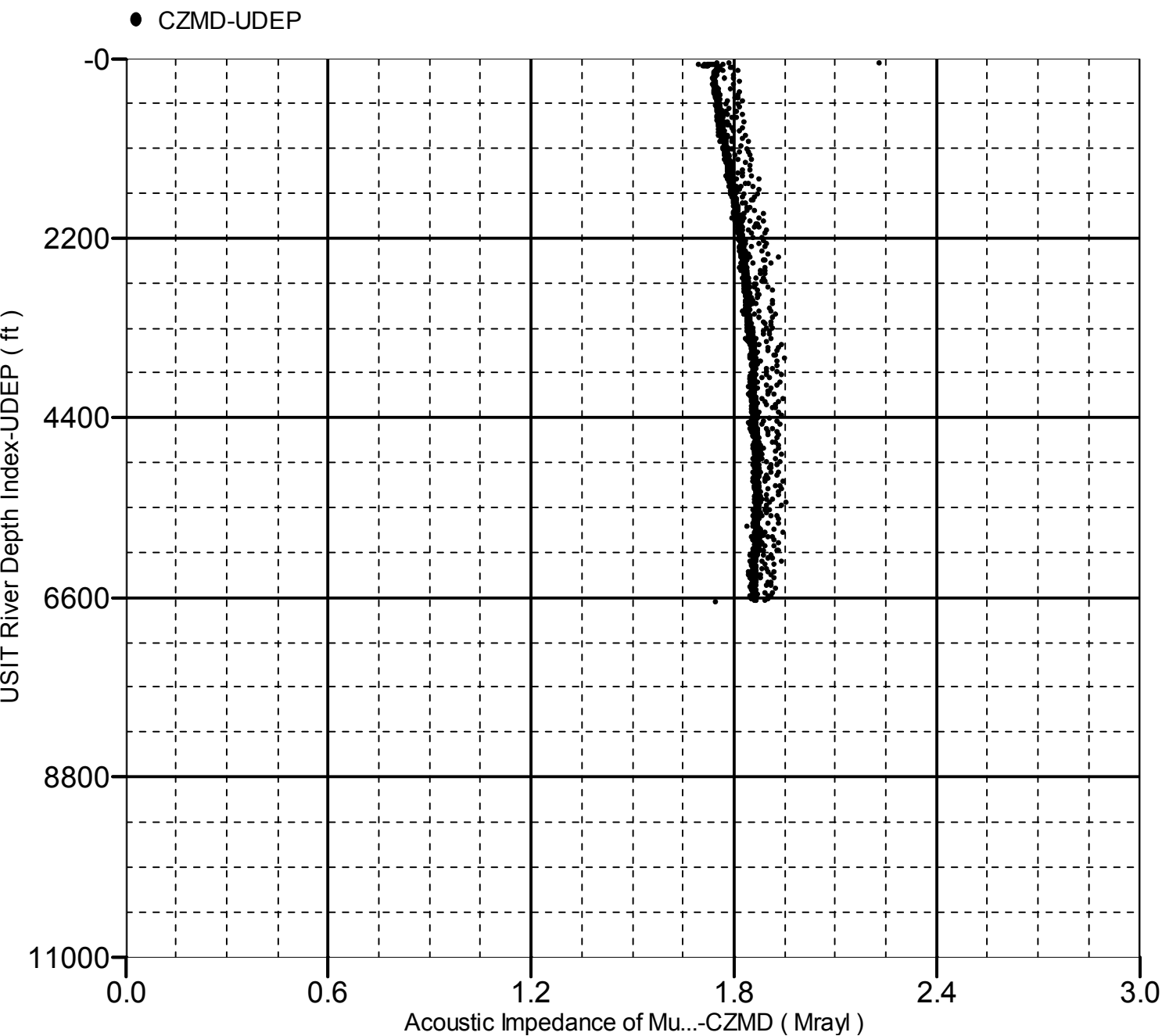
Index Range: From 6656.00 to 69.50 ft



# Acoustic Impedance of Mud vs Depth

## 2D Cross Plot

Index Range: From 6656.00 to 69.50 ft



Company: Noble Energy Inc.

Well: Shadow A26-656

Field: Wattenberg

**Schlumberger**

|                          |          |
|--------------------------|----------|
| County:                  | Weld     |
| State:                   | Colorado |
| UltraSonic Summary Print |          |